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EDITORIAL NOTES.

The Commercial Gas Company Open a Fresh Chapter.

THE meeting of the Commercial Gas Company on Thursday proved to be fraught with quite exceptional interest. The state of the Company's affairs, to which the accounts bear witness, is highly satisfactory; and we were not mistaken in anticipating from the Chairman, Mr. W. G. Bradshaw, one of those lucid and convincing explanatory addresses for which he has become famous. It is something for which any gas company may well be thankful in these days, when so much has occurred to throw discredit upon the directorial office, that the Commercial Company's Chairman at any rate has approved himself a valuable recruit of the personal forces of London gas administration. The Company have earned their dividend, with a substantial balance to carry forward. There has been better working all round; and the increase of output has helped to bring the capital down to £400 per million. An improvement has set in, with the adoption of profit-sharing, in the spirit animating the Company's workmen, although they have not yet awakened to the full perception of what the scheme can effect on their behalf. The system of discounts to large consumers operates well in retaining custom which might otherwise go elsewhere. The preponderance of a destitute alien population in the district militates against a more rapid extension of the prepayment meter branch of the business. The Company's new Act has put the undertaking on a strong and modernized footing. The reduction of the illuminating power of the gas is to be effected as from the beginning of the New Year; and Mr. H. E. Jones will then retire from the position of Engineer and General Manager of the Company, and join the Board, being succeeded in the management by his son, Mr. Stanley H. Jones. Such are the heads of Mr. Bradshaw's illuminating discourse.

The Chairman obviously was well charged with important matter. It was for the Company an historic occasion; being not merely the last of the old series of general meetings, but also the inauguration of a new statutory dispensation, with a change of men as well as of measures. To take the most striking of these subjects in order, we find first that while the Board are fairly satisfied with the working of their profit-sharing scheme, they do not regard it as an established success. In this connection we fear there is nothing for it but to preach patience. The new working man will not be created in a day, or in a year, after all the years during which the disseminators of socialistic poison have had the gas workers of the North of London at their mercy. One must not forget that Social Democratic meeting in London the other day, where the proclamation of "class war" was declared to be the one thing needful for the working class. A Gasworker was to the fore on that occasion. All the forces and influences at the command of Socialistic Trade Unionism will be arrayed against anything and everything, be it a profit-sharing scheme or what not, which has the effect of reconciling the workman with his employer. It is a matter of life and death for the Union to maintain its prestige as the only friend of the wage-earner. So long as the Union has half-a-sovereign per head of the membership, against individual destitution, it will claim this allegiance. When the members realize that there are more pounds to their credit in another cash-box than the Union has shillings, it will be a "cold morning" for the professionals who live on and by the "organization of labour "for the class war." Wherefore we think Mr. Bradshaw has reason for believing that withdrawals from the allocations to the Commercial Company's men on behalf of the scheme will be less another year. After all, there is a resource open to the management short of the abandonment of the scheme, which would only give occasion to the enemy to blaspheme. The hopeless cases of chronic Trade Union poisoning who would wreck the scheme if they could, are not indispensable to the Company's well-being in other respects. The Company have been under Trade Union influences for so long that they will only be saved "as by "fire." If the Union had been strong enough, the profit-sharing scheme would have been rejected at the outset, as in the pioneer case; and it would be a thousand pities to yield to subtlety or stupidity what was saved from force.

The retirement of Mr. H. E. Jones from the position with which he has been identified for so many years is an event in gas engineering annals. It is not unexpected—Mr. Jones having made no secret for some time of his desire to be relieved from the responsibility he has sustained so long and honourably; but few of his contemporaries realize the length of this period. The late Mr. Robert Jones was so well-known and strongly-marked a personality, especially in his capacity of one of the founders of the Commercial Gas Company, that it comes with a shock as of a surprise to learn that the record of Mr. H. E. Jones as a Gas Engineer and Manager dates from 1869, when he was in charge of the Ratcliff undertaking. During all these years, he has taken a leading part in the gas politics of the times; and he has done more than every prosperous gas engineer has been able to do—he has brought up sons to follow him. Therefore it is that at a comparatively and really youthful age Mr. Stanley H. Jones finds himself in his father's and his grandfather's place. It is an interesting circumstance; and one can easily understand that the Directors of the Company, while alive to the picturesqueness of the situation, must have pondered very carefully the reasons for and against the appointment. They are not mere registrars of other people's orders, these Commercial Directors; and one can only congratulate the recipient of their confidence, and Mr. H. E. Jones into the bargain, upon the result of their action. Henceforward the fortunes of the Commercial Gas Company will be largely in the hands of young men. Fresh blood has been put into the best places, from the chairmanship downwards; and the best wishes of the friends of the Company will go with the young hands. They will have a new Act of Parliament to work by, and "new gas" to sell! It is really a turning over of a new leaf in the history of the Company, and of the gas supply of London.

Sunday Gas Testing for London.

A CURIOUS point in regard to the interpretation of the law of gas testing in the Metropolis has arisen, and is entered in the *agenda* of the London County Council for this day's meeting, being the first after the recess. It appears that hitherto the London Gas Examiners have not been required to work on Sundays and bank holidays; but a case has occurred in the Commercial Company's district which has led the Public Control Committee of the Council to propose that this practice should be altered, and that gas should be tested daily without intermission. The facts are stated in the report of the Committee given in our news columns; and it is only necessary for the present to remark that the question is whether, when a gas company have the right to call for an average of three consecutive days' tests, the intervention of a Sunday or a bank holiday destroys the legal force of the sequence. Meanwhile, the Committee propose to prevent the repetition of any such question in the future by having a statutory test taken every day. It is not for us to offer an opinion on the law of this remarkable difficulty. There are rules for the guidance of Judges and Magistrates in the unravelling of knots of this order; and it might be thought that the first thing to be done, when an example of this kind of difficulty is met with, is to get it decided by the proper authority. Apparently, however, the London County Council are to be advised to take Themis by whatever answers to Time's forelock, and to arrange for Sunday and bank holiday testings. Again, this may or may not be in accordance with law; but, regarded as a matter of common sense, it strikes one as meticulous, if nothing more. It is reported that the Committee think of getting this extra work done by a "relief gang" of Gas Examiners, paid at the ordinary

week-day rate. This is, surely, dead against those glorious Trade Union principles which it is understood the London County Council exists to maintain, at whatever cost to the ratepayers. Would they ask a bricklayer to oblige by toying with a trowel for an hour or two on a Sunday, or a bank holiday, at the ordinary rate of wages? If not, why should the gentlemen of the Superintending Gas Examiner's Department be required to break the Sabbath and outrage St. Lubbock for less than the Trade Union scale of extra pay? This should be seen to by Mr. John Burns and his fellows, unless they wish it to be understood that there is one rule for the man who is a member of a Trade Society, and another for the man who is merely a member of the Chemical Society. Besides, let the ordinary staff of Gas Examiners beware; for when once a seven-day week all the year round becomes the rule of any employment, the specious expedient of calling in extra assistance to do the additional work is certain to disappear before long. As regards the presumed reason for this alteration, it might even be supposed that an arrangement which has endured for upwards of forty years without developing anything very dreadful might be left alone—at least until something like a respectable body of proof of its undesirability had been accumulated.

The North of England Association Meeting.

THAT another stage has been reached in the development of the industry of gas making and its adaptation to the wants of mankind was emphasized by the meeting of the North of England Association of Gas Managers at Wallsend last Saturday. The spirit of rivalry—rather of conflict—between gas and electricity, which has hitherto existed, and which was quite natural in the early days of their concurrent existence, seems to be in process of breaking down, and the two forces appear to be getting into the position of working hand in hand, in friendly co-operation, for the good of the communities they serve. There are in Ireland several beauty spots which are designated by the name of "the meeting of the waters." At Wallsend, in the Mid-Tyne district, the two currents of gas and electric business have met, and are flowing placidly in one channel. Physically, the district cannot be regarded as a beauty spot; but is not this blending of the hitherto separate forces one of the most gratifying aspects of the course of great commercial undertakings? And may we not hope that the waters may yet meet more abundantly, both in this, the cradle of the movement, and in other centres of industrial activity? The assembly over which Mr. A. B. Walker, of Walker and Wallsend, so ably presided was remarkable as being the first practical exposition of the practicability of harmonious working between gas and electricity. It would be difficult to appraise too highly Mr. Walker's presidential address, in which he gave a remarkably clear account of what has been accomplished and is being done. He has rendered a distinct service to both sides of the house, if we may use the term after the simile already employed. At least his frank and full statement will make the road easier to tread for any who may desire to follow the example set on the Tyne. It is quite probable that others may fail where the Tyneside men have been successful; but this will be through some local fault, as the success at Wallsend is largely due, it must be acknowledged, to the fine business talents and the spirit of enterprise of the men of the North. The members of the North of England Association were taken to see both the electric station, which was a novel and an instructive sight to them—the leviathan dynamos giving an impression of unlimited power—the works of the Gas Company, where they saw much with which they were familiar, but also learned a good deal of the methods that may be adopted by a Manager of ability and resource in obtaining the best results out of a situation which was, to say the least, not the most encouraging to a beginner. There were lessons for the members to carry away from both the works; and these, with the President's excellent address, and the paper by Mr. Garlick, of Barnoldswick, on the use of gas for cooking and heating, made up a measure of profitable employment of time which is not often to be met with at the meeting of a District Association. Of Mr. Garlick's paper it must be said that he marshalled his figures in a way which makes his conclusions irresistible. But, indeed, the subject is one upon which there can be no disagreement. The only effect which can be looked for from such papers as this is that they stimulate other managers to further efforts in the promotion of the policy of obtaining a day load for their works, and thus carry on a work of education.

The Gas-Works Investigation at Halifax.

THE Halifax Corporation Gas Committee are not by any means pleased that an abridgment of the report of the Sub-Committee who have been looking into questions affecting the gas undertaking, together with a summary of the observations of the Engineer (Mr. T. Holgate) thereon, has been made public. But we are afraid that for this they have mainly themselves to thank. It is months since the ratepayers were made aware that, from the financial aspect, the present position of the undertaking was not all that could be desired; and what they have been anxiously waiting to hear is something as to the causes. But the Gas Committee seem to have taken the matter up in a very leisurely fashion; and there has been no hurry on their part to throw light on the subject. This dilatoriness can only be due to one of two or three reasons. It may be that the task the Sub-Committee found themselves confronted with was, for them, such a stupendous one that it could not be promptly dealt with. If so, then the Gas Committee would have done wisely to so inform the ratepayers. It may also be that, from the point of view of some of the members, the less known by the ratepayers the better before the November elections; or, again, it may be that the Committee were hoping that delay would produce a rift in the cloud, and a promise of better things with which to mollify public feeling. We are rather inclined to the view that the first is the correct reason for the delay that has taken place; and if this surmise is true, the Committee have not, in adopting such a depth of secrecy as they have done for so many months, shown that tact and discrimination of the best procedure that is expected of men of such trained business faculty and resource as are the members of the Committee. There is here no reflection whatever upon individual members—procedure being settled in connection with public bodies by the vote of the majority; and therefore they must be dealt with collectively. A few discreet words such as the Chairman (Mr. G. H. Wadsworth) is quite capable of uttering when occasion demands, would have done much to allay public anxiety and curiosity; so that it must be maintained that, for what has happened in the way of publication to appease the public appetite, the Committee themselves are largely responsible.

The summaries of the reports published by a Halifax paper were reproduced in these columns; but we must disclaim all knowledge of there having been any underhanded proceeding on the part of our local contemporary in obtaining those reports, such as Mr. Wadsworth asserted to be the case in addressing the Town Council on the subject at their meeting last Wednesday. But little harm can have been done, seeing that Mr. Wadsworth himself confesses that personally he has nothing to keep back, that he courts the fullest inquiry, that he prefers that the Council should have the Sub-Committee's report, and that he agrees the ratepayers have a perfect right to know the facts with regard to the question. Of course, it is only proper that the Council should have had copies of the report and the Engineer's observations upon it before the public; but even now the presentation of the report to the Council is to be deferred—they having adopted a motion by Alderman Smith that six independent members should go over the report with the Gas Committee, and see how they have arrived at their conclusions, and then, if they are all of opinion that these are correct, copies are to be sent to the members of the Council. Methods of filtration that are not based on scientific principles have little good effect; and the subjecting of the report to defecation by a number of councillors who know nothing more about gas matters than the ordinary consumer whose acquaintance with gas extends to the price charged per 1000 cubic feet, can result in little benefit.

While taking a perfectly independent attitude in connection with this domestic controversy, we cannot help feeling that Mr. Holgate's suggestion that the whole matter should be referred to an expert of standing, who would be unprejudiced, and qualified in a way that perhaps not more than one of the Halifax councillors is qualified to pronounce judgment on the gas undertaking throughout, is the course that should have been adopted before this; and it would

now be the way—and the only way, let it be emphatically said—by which an accurate appreciation and knowledge of the exact position of affairs can be obtained, and justice done to all concerned.

More Welsh Trade Unionism.

THE persistent sameness of Trade Union ideals and intentions has often been exposed in these columns. However plausible and seemingly conciliatory the professional exponents of Trade Union principles may appear, on occasions when it suits their purpose to assume the mask, the old tyranny, intolerance, and class selfishness remain as strong as ever, and continually peep out through the rents and gaps of the scanty robe of time-serving policy which a Trade Union Congress orator condescends to don for the moment. As soon as they think they have sufficiently hoodwinked the outside public by their professions, they hark back to their old courses, and try again the familiar devices for ruining the industries they affect; as in the Bethesda case at present. It is no mere accident that professional Trade Unionists are almost to a man pro-Boers. There is very much in common between the Boer and the Trade Union agitator who remains at daggers drawn with Lord Penrhyn. Both act upon the simple faith in British foolishness which those who judge the Englishman by some of his politicians and newspapers may be excused for attributing to him. Both, because the present-day newspaper likes to flit from one topic to another, and drops the sacred and immutable principles of to-day in favour of some fresher eternal cause of the morrow, delude themselves into believing and hoping that the Englishman is a man to be tired and worried into yielding to his enemies. Both, finally, mistake kindliness for weakness, and make every concession the ground for asking for something else. They are egregiously mistaken. All that the Bethesda strikers, who are ruled to their loss by outside tyrants of their own choosing, want of Lord Penrhyn is his property—that is to say, the control thereof, which is the same thing; and they are no more likely to get it now than they were when they entered upon their campaign.

In another part of Wales the normal course of Trade Union politics has been disturbed by a remarkable "sport," in which tinplaters, steel makers, boiler stokers, the Dockers' Union, and eke that of the Gas Workers, are mixed up in a most inglorious confusion. In the first place, the trouble is a good example of what comes of these scavenger Unions, which take any man who thinks it worth while to pay for their cards. It began with a demand emanating from a few firemen at Llanelly for an eight-hour shift. These men belong to the Gas Workers' Union. There is a Conciliation Board which is supposed to regulate the labour conditions in the tinplate industry; and there is likewise a Wages and Disputes Board representing the Union hands in the local trade, with the exception of the firemen and engine drivers. This Board refused to have anything to do with the firemen; and the employers referred them to the Conciliation Board. Meanwhile, the Gas Workers decided to act independently; being backed up by their official leaders, including Mr. Will Thorne, who thought the men had a genuine claim to the eight-hour shift, especially as the majority of other workmen employed at the plate-mills only work for eight hours a day. The employers, however, declared that such a drastic alteration of the hours of firemen's labour should have been brought up as part of the settlement for the whole trade made in July, when it was not mentioned. They further protested against such a sectional way of treating a labour question, while the Conciliation Board is in existence; and accordingly they announced their determination to resist the demand.

This, of course, meant that "the fat was in the fire." Organized labour once more exhibited its distrust and defiance of a Conciliation Board, and gaily went back upon its tacit agreement with the employers of a couple of months previously. The local leader of the Gas Workers was party to this agreement, which was to last for twelve months. Although the number of firemen concerned is barely 40, their revolt jeopardized the employment of upwards of 4000 men, and imperilled the trade of the district. The employers seem to have been indifferent on the question of stopping, as trade is bad. Rather than trouble about replacing the strikers, therefore, the employers—who must be credited with knowing their own business certainly as well as Mr. Will Thorne and his merry men know theirs—are perfectly content to let the different Unions affected fight it out between themselves. As soon as the works stopped, Mr. Thorne went down and made a speech explaining the situation from the Gas Workers point of view. This was that the July settlement, which had been brought into question, did not affect or apply to the firemen at all. If so, it seems odd that a Gas Workers' organizer consented to the settlement, and put his name to the agreement for twelve months. Naturally, the employers make a point of this, and claim that they would have carried out the agreement honourably, if the men had left them alone. The suspicion soon arose that the Gas Workers had rather made a hash of the business; and that other lion of the Trade Union cause, Mr. Ben Tillett, of the Dockers', to which Society most of the tinplaters own allegiance, has been down to Llanelly roaring on his own account. Mr. Tillett's first speech on the subject was a model of oratory of the egg-dancing variety. His Dockers were not to blame. Nor were the employers in the tinplate trade, who were all gentlemen. He much regretted these harsh and arbitrary strikes. So bad for business! Of course, the great Docker could not say anything unkind of his friend the great Gas Worker; but he spoke at him. The employers must have smiled at the newspaper reports. Business in Llanelly is paralyzed; and the men of the other Unions are saying unsympathetic things about their firemen brothers, whose solicitude for their health is put forward as the reason for their precipitate action. It will soon be asked sarcastically whether they feel any the better for having nothing to do, with 4000 others keeping them company. The bitterest reflection for the Trade Union men, however, must be that their dear brothers have played the masters' game entirely. Naturally, as good Society men, they would have been compelled to go on strike themselves, if the employers had elected to turn out the firemen neck and crop, and take on free men. But the masters did not care. And now the funds of all the Unions concerned will be depleted to pay the piper for the tune that was called by a handful of idiots, who did not know the elementary rule of not forcing on a strike during a falling market.

The Lesson of M. Zola's Death.

THE death of M. Zola, in circumstances which have been made known throughout the civilized world, is as replete with lessons for whomsoever can profit by them as any of his marvellous contributions to the literature of his country and tongue—which is saying much. Many now living, and of those who will come after, will rank him with the very greatest men of his age and nation. Perhaps he was indeed the greatest Frenchman of his time, if we are still content to rank men according to the old order—"prophet, priest, "and king." For Zola was a prophet, to those who can perceive it; and the fact of his having worn his mantle in a Gallic fashion must not be allowed to deteriorate from its essential character, if it did not enhance its attractiveness. And this truly great man—rich in this world's goods through his own industry, thoroughly well instructed in regard to the ways and means of life in a centre of civilization, able to command every aid to secure healthy and comfortable existence—was killed like a stray animal in a lethal chamber. The sardonic humour of such a taking-off was just what he might have imagined for one of his own puppets, when it had become a dramatic necessity to clear the stage. Amid all the verbiage of the newspaper reports that detailed the circumstances of Zola's end, it is indeed difficult to discover precisely the particulars desired by those who would fain understand what occurred. As Mr. Fletcher, who very pertinently writes to us to point one moral of the story, justly observes, newspaper science went wrong as usual over the "smell of carbonic acid" which was stated to be noticeable in the fatal sleeping apartment. It seems past hoping that the very alert and clever gentlemen who engage in journalistic work of a general character should possess some elementary knowledge of the sciences concerned with the things of every-day life—and death. And, of course, it is part of the irony of experience that their errors and ignorances should so commonly exhibit a positively pernicious quality. His ordinary senses are used by man as sentries to give timely warning of the presence of danger in his material environment; but they have their limitations, and require to be supplemented by that other safeguard which is called

scientific knowledge. This is an ever-growing requirement, as we have often maintained in these columns. The advance of material civilization, the increase of the labour and trouble-saving conveniences which is so conspicuous a feature of modern life—which is the modernity of life, so to speak—is attended with the call for the incessant exercise of a circumspection which our ruder and less luxurious ancestors were spared. The modern citizen knows he may suffer a horrible death if he touches some innocent-looking wire. A glass of sparkling well water, such as his forbears would have quaffed without a second thought, is rejected by him for reasons which they could not have appreciated. He ought to know, but apparently does not in all cases, that an atmosphere which gives no warning to his senses may be heavily charged with as deadly a poison as the chemist can produce from his laboratory. And the origin of this poison may be the domestic hearth itself.

It has been stated that the chimney flue of the room in which Zola took his last sleep was known to be defective. We have not been able to ascertain what description of fire-grate, or stove, was in question; but it is reported that the fuel used was egg-briquettes, the foundation of which is dust coal or coke. After having been ignited, these burn smokelessly; and for this reason, as well as for their cheapness, they are admired by smoke preventionists and householders of an economical turn. Thriftiness is a typical French quality; and probably the Zola household was not different from the others in respect to the propensity to the saving of "sous" in the smaller expenses. This, and long habitude to the same kind of firing, will explain the use in so wealthy an establishment, even for the best rooms, of the cheapest description of fuel. Starting from this fact of the fuel, the story of the night's occurrences, so far as these are known, hangs well together. When the fire was first lighted, it smoked, and the bedroom windows had to be opened. This was the pitch agglomerate burning off. Afterwards, the dully smouldering fire would give no sensible warning of what it was doing. There is a useful French proverb which says that "a door must be either open or shut;" and this is emphatically true of the French window. It cannot conveniently be left partly open, for the purpose of ventilation, because it opens right down to the floor. Therefore, French people, who like to pass as much of their lives as possible in the open air, and do not mind having the windows of their bedrooms wide open during hot weather, have no middle course between this state of things and a hermetically closed apartment—which, again, they equally prefer when the weather is at all chilly. M. Zola, who, with all his culture, was a real Frenchman, had his bedroom windows carefully closed when, on that cold and raw night of this unkindly season, he went to bed for the last time in his gorgeous Paris home.

Records such as this make the artificial agitation about the presence of a little more or less carbon monoxide in gas supplied in England for lighting and heating purposes look more than a little silly. There is no legislation in this country on the subject of domestic flues; and the draught-hating householder can stuff newspapers into his bedroom chimneys to his heart's content, while complaining that "the gas" makes his house stuffy and his womankind anæmic. The one risk attending the extended use of gas-fires, even those duly provided with flues, is lest the wholesome custom of the annual chimney sweeping throughout the English dwelling-house should be foregone in consequence of the substitution of the new heating appliance for the old. Mr. Fletcher will permit us to observe that a gas-fire with a flue does not always ventilate. One truth of the matter one may at any rate be certain about; which is that the diversion of medical and other orders of public concern from the really important question of adequate house ventilation as a means of preserving health, to the quite immaterial and remote consideration of the composition of ordinary illuminating gas, would not only be a blunder of the first magnitude in itself, but would also contribute to the perpetuation of insanitary practices on the part of house builders and occupiers which should be suppressed by all the power of public opinion and an enlightened Government.

The Coal Strike in the United States.

The strike of the miners in the anthracite coalfields of Pennsylvania, which has been in progress since May last, had not, until recently, exercised any appreciable influence over the coal trade in this country, except by way of a slackening of competition between American and British anthracite in neutral foreign markets. The exports of that class of coal from the States during the first seven months of this year fell to 619,000 tons from 1,240,000 tons in the same period of last year; 200,000 tons of that decrease occurring in the one month of July. Now, however, that the winter is at hand, and the American householder is desirous of laying in his supplies of smokeless coal, the position of affairs across the water is becoming of more importance to the coal buyer in this country. So much greater is the demand for coal in the States than the available supply, that the position of two years ago is exactly reversed. Then we were importing coal from America in spite of the handicap of the freight across the Atlantic. Now, in spite of a similar handicap, and of the further obstacle of an import duty of about 2s. 9d. per ton upon all soft coal and upon anthracite containing less than a certain percentage of fixed carbon, considerable orders from New York, Boston, and Philadelphia have been placed in Wales for both anthracite and special qualities of semi-bituminous coal. Several cargoes have been despatched, and the orders have already run into six figures.

Seeing that the reduction in output caused by the strike is, roughly, 100,000,000 tons per week, and that, in consequence of the stoves in use in so many American houses, and of the strict enforcement of the anti-smoke laws in the States, the shortage of smokeless coal cannot be readily made up from the bituminous supplies (though to some extent that is being done, in defiance of the laws, which may have to be suspended temporarily), it is obvious that, should the strike continue for any length of time longer—and there are no present signs of collapse—the effect upon the exports from this country will be a factor in the situation here during the coming winter. Indeed, even if the strike came to an end immediately, there is such a dearth at the present moment in the States that the importation of coal would probably continue for some months, until the market resumed its normal condition. When it is considered that the point at issue is the refusal of the mine owners to "recognize" the Union, and that the men's cause is practically in the hands of one man—an agitator of the name of Mitchell, to whom his personal reputation is probably of infinitely greater importance than the welfare either of the men or of the trade of the country—it will be seen that the prospect of President Roosevelt's bringing about an early settlement by his appeals to the citizenship of both parties is not a very bright one.

With the scarcity of pig iron and steel in America sending up the price of the former in this country a good 8s. per ton compared with a year ago (53s. 6d. against 45s. 6d.), and with the scarcity of anthracite in the States leading to considerably increased exports of coal from Wales, the trade reports from "the other side" are becoming of increasing importance to iron and coal consumers in Great Britain. One of the most immediate results of the present position should be an improved market for coke.

Nottingham v. Sheffield.

The comparison made early this year by Sir Frederick Mappin of the working results of the Sheffield Gas Company with those of the Nottingham Corporation, have in due season borne fruit. These comparisons were so unflattering to Nottingham, as a Corporation gas undertaking, that it was to have been expected that some one or another of the members of the Council would, when opportunity offered, be wanting to "know the reason why." This anticipation was not doomed to disappointment; for at the last meeting of the Nottingham City Council, when the annual report of the Gas Committee was presented, Alderman Radford took the floor, and called the attention of those present to the statements made by Sir Frederick. Indeed, the Alderman's remarks were so severe that the Gas Committee have felt themselves called upon to offer a rejoinder. This they have done in the shape of a report which, if in the meantime nothing unforeseen happens, will have been considered by the City Council ere these lines are in print. The Sheffield Gas Company remind one of a very good boy at school, who is always more or less of a trouble to some of the other boys, owing to the impossibility of their so behaving as to bear favourable comparison with him. The boys, of course, may be differently constituted; and the gas undertakings may be to some extent differently situated. Any

way, the report of the Nottingham Gas Committee constitutes a very able defence of their management of the department committed to their charge. Dealing with the cost of coal, for which Nottingham pays close upon 3s. a ton more than Sheffield, the Committee say that this discrepancy is in consequence of the close proximity of Sheffield to the Yorkshire gas-coal fields. Then, again, the illuminating power of the gas supplied at Nottingham is more than one candle higher; and besides this the Committee urge that their larger output and compact area of supply is a great advantage to the Sheffield Company. Many other points in regard to which Nottingham is handicapped are referred to; and, taken altogether, the Committee are of opinion that the facts they have brought forward in their report show that Nottingham is not in a worse position than Sheffield, "when proper explanations are afforded." As we remarked on a previous occasion, relative to the results at Sheffield and Manchester, no two places are situated precisely alike, and therefore an exact comparison is impossible. There are always local considerations to be taken into account. But, whatever may be the merits of the present discussion, we are sorry to see, in the report of the City Auditor on the accounts of the Nottingham Corporation Gas Department, the trail of the municipal trading serpent. The Auditor remarks that a sum of over £19,000 has been relegated to the capital account of the gas-works, nearly the whole of which, had the gas concern been in the hands of a private company, would have had to be borne by the Tramways Department. In face of such a statement as this, how can it be expected that the Gas Committee can make the best possible showing with the works which are under their control?

A Good Policy in Dublin.

The Alliance and Dublin Consumers' Gas Company must be securing the goodwill of their customers, even if they are not so fortunate with regard to the Corporation. Last December, the price of gas was reduced 3d. per 1000 cubic feet, which meant a gift of over £7000 to the users of gas; and at last week's meeting, the Chairman (Mr. Charles Lawler, J.P.) intimated that another similar reduction would take place as from the end of this year. This is the best possible answer the Company can make to their critics; and it is also the best policy they can adopt for their own welfare. The prepayment meter system has been very successful in Dublin; and no doubt the lower the figure to which the cost of gas can be reduced, the greater will this success become. There are now close upon 12,000 of these meters in use in the city; but there is, of course, still plenty of room for development in this direction, and the Company are going the right way to bring such development about. The Directors are the more to be commended for their courage in announcing at the present time a further reduction in the price of gas, seeing that the returns from residuals are with them (as with other gas undertakings) on a much reduced scale as compared with last year.

What is a Profit?

The partisans of municipal electric lighting have, as was to be expected, been exceedingly busy during the past week trying to explain away the figures regarding their pet idea which were published in the Board of Trade electric lighting returns, noticed in our last issue. This is not surprising, seeing what the nature of the figures was. Some of the arguments brought forward in this connection are, however, truly astonishing; and among these may be cited a contention of Alderman Beale, of Birmingham. This gentleman, in giving a toast at a dinner which followed the laying of the foundation stone of the electric power station at Aston, is reported to have said that the assertion that the municipalization of the Birmingham electrical undertaking had resulted in turning a profit into a loss, was "one of those half-truths which deceive people, and which could be explained directly." The explanation he went on to furnish was that in the case of a company the profit was arrived at before the dividend was paid, whereas in that of a municipality they took the loss after they had paid interest and sinking fund. "They all made that mistake; they did not seem to understand that interest and sinking fund were the same as dividend in a company." We must confess to being among those who do not understand that interest and sinking fund with a municipality are the same as dividend in a company. Is not Alderman Beale confusing gross profit with net profit? The latter, of course, is the figure in which ratepayers or shareholders, as the case may be, are interested. Both with companies and corporations, the net profit or loss on working must be arrived at after the deduction of the fixed charges on the undertaking; and to this category belong the items of interest and sinking fund. They are obligations which are in any event bound to be met by the municipality; and their payment does not depend, as does a dividend on a company's capital, upon the amount of the receipts. In the case of one municipal electric lighting installation the receipts of which are insufficient to pay the interest and sinking fund charges, the Local Government Board are insisting upon the deficiency being met out of the next rate. We should say this is making good a loss (not making up a profit); and whatever Alderman Beale's views may be on the subject, we feel sure the ratepayers will agree with us. It will be necessary for some more convincing arguments than this to be adduced, if they are to remove from municipal electric lighting finances the distrust with which they have come to be almost universally regarded.

Where the Money Goes.

Some startling figures were given by Alderman Gibson, the Chairman of the Gas Committee, while opposing in the City Council last week a proposal of the Manchester Electricity Committee to fix a number of arc lamps "with a view to making certain experiments as to the best form of electric street lighting." The 29 electric street-lamps already in use in Manchester cost, for the year ending March 31 last, £632, or about £22 each, as against £4 per lamp for gas; and besides this there was a cost of £11 per lamp for maintenance, as compared with £1 for gas. These figures are alarming enough, in all conscience; but there was still worse to come. The Alderman went on to say that the Electricity Committee's capital account was as high as that of the Gas Department, and was still increasing rapidly (the Department being committed to a further expenditure of £300,000), though they only did one-fifth as much business as the gas-works. The revenue of the Electricity Department for last year was £134,462; while that of the Gas Department was £763,210. On the basis of these figures, it would seem that, in order to secure the same amount of revenue, the capital outlay on electricity would be five times as much as for gas. The figures in regard to capital expenditure were considered by another speaker to have "a very awkward and ominous appearance." With this opinion we entirely agree; and it is gratifying to note that the Council were sufficiently impressed by the strong array of facts marshalled by Alderman Gibson to refuse, by a large majority, the leave sought by the Electricity Committee to further experiment.

WATER AFFAIRS.

The Meeting of the East London Water Company.

THERE were several features of interest in the proceedings at the meeting of the East London Water Company last Thursday, as will be seen by the report which appears in another part of the "JOURNAL." The accounts presented showed an increase of revenue to the amount of £6237, and a reduction of £4184 in the expenditure, in the half year ending at Midsummer, compared with the corresponding period of last year; so that the Company were relatively about £10,000 to the good. The number of new services connected was, however, rather less—3060 against 3594; but they represented business of a better character. The increase in the water-rates was, in round figures, £2500 less than in the first six months of 1901; but this was attributable to fluctuations in the demand for water for trade and parochial purposes, which is supplied by meter, and did not mean a falling off in the residential supply. The result of the working was a disposable balance of £89,995; and out of it a dividend at the rate of 8 per cent. per annum, less income-tax, was declared, leaving £21,173 to be carried forward. Although, according to present appearances, it will not be very long before the undertaking passes out of the Company's hands, the Directors have not relaxed their efforts to maintain the whole of the plant in its usual state of efficiency; thus guarding themselves against the insinuation not unfrequently made in the case of the transfer of a private undertaking to a public authority, that ordinary

restitution had been neglected in order to increase the profits. Under the able supervision of the Engineer-in-Chief (Mr. W. B. Bryan, M.Inst.C.E.), the works are capable of not only satisfying present demands, but of effectively meeting those resulting from a large future extension of the business. Evidence of this is afforded by the fact that before the end of the present year two new storage reservoirs, holding 1200 million gallons, will be added to the very large area now in possession of the Company.

In view of the fact that Parliament will in a few days be again in session, and engaged in considering the Government Water Bill, it was only to be expected that the Chairman (Colonel Lockwood, M.P.) would devote some portion of his address to a consideration of this measure. He explained that during the long inquiry before Lord Balfour's Committee, attention had been more specifically directed to those clauses in the Bill which might operate adversely to the interests of the proprietors; and, speaking broadly, he thought that, after a good deal of giving and taking, those interests had been fairly well safeguarded. He made special reference to one point gained on the initiation of the Secretary of the Company (Mr. I. A. Crookenden), which makes it perfectly clear that the basis of settlement, so far as the revenue account is concerned, is to be one of assets and liabilities on the day appointed for the transfer, which now stands as Dec. 31, 1903, or such other date within eighteen months as the Local Government Board shall determine. Of course, if the provisions of the Lands Clauses Act had been adopted, the "novel and complicated innovation," as Colonel Lockwood called it, of the "appointed day" would have been rendered unnecessary. This entirely new departure, initiated by the London County Council, and based upon an "egregious fallacy," is the great blot upon the Bill. There are many others, from its opponents' point of view, as evidenced by the long list of amendments placed upon the paper of the House of Commons. As to what will be their fate, or that of the Bill itself, it would be useless now to speculate. It may be assumed that the undertakings of the London Water Companies will eventually be managed by a public body; but we venture to doubt whether the consumers or the ratepayers will be benefited thereby. The craze for the municipalization of everything has been at the bottom of the agitation persistently kept up against the Water Companies; though, judging by the articles which have lately appeared in "The Times," the adoption of the principle has not always proved an unmixed blessing. Whatever may be the result of its application in the present instance, the owners of the property taken have, at all events, a right to expect from a Conservative and Unionist Government such fair and equitable treatment, by way of compensation, as their position of purveyors of a commodity necessary for the healthfulness of the community justifies them in claiming.

Another interesting feature of the proceedings—a personal one—calls for notice. It was the decision of the proprietors to make provision for the retirement of the Secretary, and to recognize in a substantial manner the great service he has rendered to the Company for close upon a quarter of a century. When it is remembered that during the past decade there have been two Royal Commissions on the London Water Supply, and that within practically the second half of it the Company have had to carry through three Bills of their own and to oppose those of the London County Council, it will be seen that Mr. Crookenden has had no light duties to discharge. These alone would, in our opinion, have fully entitled him to the consideration which has been shown to him. But there have been other duties. In the period in question, the Company had to bear the stress of the great droughts, during the prevalence of which it is no exaggeration to say that the Directors and officers came in for more obloquy than any other public servants in the Metropolis. No one but those behind the scenes could appreciate the extent of the anxiety this extraordinary visitation caused the Secretary, and necessarily his colleague the Engineer. But it was recognized by the Board, and Mr. Crookenden will now reap his reward. It has been arranged that, immediately before the undertaking is transferred to the new body to be constituted, he shall receive an *honorarium* of 2000 guineas, and retire with a pension of £1000 per annum, free of income-tax. His valuable assistance will, however, be retained in conducting the Company's case before the Arbitrators. This task accomplished, we trust Mr. Crookenden may for many years enjoy the leisure which he will have justly earned.

ESSAYS AND REVIEWS.

GAS ACTS FOR 1902.

THE following Acts relating wholly or in part to gas supply were passed before the adjournment of Parliament; and, according to custom, we give an abstract of their principal, or peculiar, provisions.

The Bradford-on-Avon Gas Act incorporates and confers powers upon a limited Company originally formed in 1834. The share capital of the Company consisted of £10,000, with no borrowed money. The limits of the Act are the parish and urban district of Bradford-on-Avon, and the parishes of Bradford Without, Holt, South Wraxall, Westwood and Ilford and Winsley, all in Wiltshire. The capital is increased to £16,000, whereof £7960 represents the paid-up original capital, and £8040 is additional share or stock capital; not more than £6000 nominal value being issuable as preference capital. The standard rates of dividend are 9 per cent. on the original, and 7 or 5 per cent. on the additional capital accordingly as it is raised as ordinary or preference capital. Power is given to borrow to the extent of one-third of the amount of all the share capital fully paid up. The standard price of 15-candle gas is 4s. per 1000 cubic feet in the parish of Bradford-on-Avon, and 4s. 8d. beyond. The testing-place for gas is to be on the works or within 200 yards from any part thereof. The Company may specify internal fittings. A purchase clause is inserted in the interest of the Bradford-on-Avon Urban District Council.

The Chard Gas Act incorporates and confers powers on a limited Company formed in 1870. The share capital of the Company was £12,000, with, in addition, £3000 borrowed money. Cash to the amount of £1500 had been expended on the undertaking out of revenue. The capital of the Company is stated to be £30,000 in stock, whereof £6000 represents original capital, £1500 represents the improvement outlay, £6000 is original preference stock, and £16,500 is new and original capital. These classes of stock bear dividends of 10, 5, and 7 per cent. respectively. The loan capital is to be in the proportion of one-third. The auditors need not hold shares or stock in the Company. Interim dividends not exceeding one-half of the standard rates may be declared. The initial prices of 14-candle gas are 4s. 2d. per 1000 cubic feet within the borough of Chard, and 4s. 7d. beyond, with the proviso that no increase upon the standard rate of dividend shall be payable in respect of any year during any portion of which the net price charged to any consumer (after allowing for any discount which may be claimable) shall have exceeded 3s. 11d. per 1000 cubic feet within the borough and 4s. 4d. elsewhere. Interest at the rate of 5 per cent. is payable on consumers' deposits. Consumers' fittings may be specified. The Company may apply for an Electric Lighting Order. A purchase clause is inserted in the interest of the Corporation of Chard. Not more than £6000 additional capital is to be raised by the Company before Jan. 1, 1904.

The Caterham and District Gas Act incorporates a Company originally formed in 1869 under the name of the Caterham and Kenley Gas Company, Limited, subsequently altered to the Caterham and District Gaslight and Coke Company, Limited, who obtained a Provisional Order in 1887. The share capital of the Company consisted of £35,000, divided into £25,000 original 10 per cent. capital, and the remaining £10,000 is 7 per cent. capital. The whole of the original capital had been fully paid up, and one-half of the additional capital was issued as preference shares. The Company had raised as mortgage debenture stock £6250, and were further indebted in £2300. The district of the Company is defined. The clause indicating the "general purposes" of the Company is novel. It states that the Company may supply "gas for light, heat, power, and any purpose to which gas, whether manufactured from coal, slack, or other substance or liquid, may be applicable." The capital is increased to £60,000, whereof £30,000 is additional, with one-fourth loan. In addition to the powers which the Directors exercise under the Companies' Clauses Acts, they may determine the remuneration of the Secretary. Professional auditors may be appointed, and auditors need not be shareholders. Interim dividends are payable. The Company, in the usual clause as to powers of construction and maintenance, are authorized to make and store "power gas," which is elsewhere defined to be any gas capable of being used for purposes of motive power, incandescent lighting, and heating, but not being of the quality prescribed for lighting purposes. Pipes may be laid and used for ancillary purposes. No lands are to be acquired in Caterham for making or storing gas thereon without the previous consent of the Urban District Council. The maximum price of lighting gas is 5s. per 1000 cubic feet. The quality of coal gas supplied for illuminating purposes is to be 14 candles; but power gas need not be of any illuminating quality. The latter is not to be supplied at any time containing more than 14 per cent. of carbon monoxide, or which does not possess a distinctive and readily perceptible smell. The penalty for contravention of these provisions is £50. The duty of enforcing this portion of the Act is placed upon the Inspectors of Factories or of Mines within the district, "and such Inspectors shall, for this purpose, have all powers and authorities conferred by section 119 of the

Factory and Workshops Act, 1901, and by section 41 of the Coal Mines Regulation Act, 1887, and section 17 of the Metalliferous Mines Regulation Act, 1872;" provided that notice of action must be given to the Company. Consumers' fittings may be specified. Interest at the rate of 4 per cent. is payable on consumers' deposits. Nothing in the Act exempts the Company from the provisions of any General Act relating to the supply of power gas hereafter to be passed.

The Rickmansworth Gas Act incorporates a Company formed in 1852, who obtained a Provisional Order in 1885. The capital authorized by this Order was £10,733, entitled to 10 per cent. dividend, and £5000 taking 7 per cent.; and there was a mortgage debt of £3933. The limits of the Act are the urban district of Rickmansworth and the parishes of Rickmansworth Rural and Chorleywood. The "general purposes" clause states that the Company shall be established for manufacturing and supplying gas for any purpose to which gas may for the time being be applicable. The capital is increased to £46,000, and the old share capital is to be consolidated. Unsold issues may be offered to existing stockholders, employees, or consumers. Borrowed money is to be in the proportion of one-third of the stock issued; and is not to be raised at a higher rate of interest than 4 per cent. In respect of shareholders' voting powers, it is provided that no votes shall be valid in regard to stock transferred less than three months before the meeting. A fresh body of Directors may be elected at the first ordinary meeting held after the commencement of the Act. The transfer books may be closed, and an interim dividend declared, half yearly. Certain particulars are enacted in regard to road openings. No pipe trench is to be opened for more than 50 yards in length at a place where only one cart can pass beside it, or for more than 100 yards where two carts can pass. Pipes are to be laid 2 feet deep wherever possible. Pipe alterations required by the Public Authority are to be at the cost of the Company, including surveillance; and the Authority is not to be liable for damage by steam-rollers to mains laid after the passing of the Act. The standard price of 14-candle gas is 4s. 7d. per 1000 cubic feet. Consumers' fittings may be specified. Consumers are to receive 4 per cent. interest on their deposits. A purchase clause is inserted for the benefit of the Urban District Council. No additional capital is to be raised without the consent of the Council; but the Company may borrow from their bankers to a limited amount.

The Shepton Mallet Gas Act incorporates a Company formed in 1836. This concern was duly registered as an unlimited Company under the Act of 1862. The capital consisted of £4250, with £1450 borrowed on mortgage. In addition to this, the Company had expended upwards of £4500 out of income upon their undertaking. The limits of the Act are the parishes of Shepton Mallet and Croscombe, Somersetshire. The capital is increased to £14,500; whereof £6000 is additional, £4250 represents the original capital, and £4250 is the improvement capital. The last division takes only 3 per cent. dividend. The standard price of 14-candle gas is 4s. 2d. per 1000 cubic feet. Unsold stock is to be offered to employees or consumers. The borrowing powers are equal to one-third of the capital issue. Consumers' fittings are to be specified. With the concurrence of the District Council, an Electric Lighting Order may be applied for.

The Wadhurst Gas Act incorporates a Company to supply the parishes of Wadhurst, Ticehurst, and other places in Sussex. The powers of the Act are not to be exercised in the parish of Salehurst without the consent of the Rural District Council of Ticehurst. The capital is £25,000, with £8000 on mortgage. The compulsory powers of the Company for the purchase of land are not to be exercised after the expiration of three years from the passing of the Act. The Company are to acquire the undertaking of the Ticehurst Gaslight and Coke Company, Limited, within twelve months. The maximum price of 14-candle gas is 5s. 6d. per 1000 cubic feet. Interest at the rate of 5 per cent. is to be paid on consumers' deposits. The Company are empowered to apply for an Electric Lighting Order.

THE GAS AND WATER STOCK MARKET.

(For Stock and Share List, see p. 958.)

THE Stock Exchange has had rather an agitated week. The centre of disturbance lay in the American market; but the area of unrest was far-reaching. The business actually done was almost wholly professional; for the tone was a good deal too sharp set for the public to chime in. In sympathy, almost everything was flat at first, but when on Thursday the expected rise in the Bank rate became *un fait accompli*, a degree of relief from the incubus of uncertainty was experienced, and things took a more favourable turn. Prices, of course, are down; but the closing figures were not the worst. The Directors of the Bank of England raised the rate of discount to 4 per cent. from the 3 per cent. rate which had lasted from Feb. 6. The stringency had rapidly intensified for the previous week or so; and the impending advance had become so clearly inevitable that it was to a great extent discounted. In the Gas Market, business was quiet enough at the opening. But it quickly became more lively; and the result by the end of the week was to show a much more active period than has ruled of late, despite the fact that it was only a five-day week—the Exchange being closed on Saturday. The general tendency may be written down as fairly steady, for only two changes in quotations were noted in the London Exchange. In Gaslight issues, the ordinary was tolerably active every day; and it changed hands at figures which never ranged outside the limits of 87⅛ and 88⅜. There was not much doing in the second issues; and, of course, in view of the state of the Money Market, good prices could not be expected. However, only the preference fell a point. There was more animation in South Metropolitan, and at one time it looked like receding. But it rallied later, and on the closing day changed hands at 122¼—the best of the week. Nothing at all was done in Commercials. In the Suburban and Provincial group, there was nothing to note in the London Market; but locally Sheffield and Newcastle had each a slight rise, and the Liverpool price was drawn in closer. The Continental Companies were quiet. Imperial was very steady; but European fell half a point. Among the remoter undertakings, the Melbourne bonds came out rather better *ex div.* The Water Companies were not more interesting than usual; and their movements were confined to an advance of a point in East London.

The daily operations were at very level prices, and call for no further detail. The few changes effected were: A rise of 1 in East London Water on Monday, a fall of ½ in European fully paid on Thursday, and of 1 in Gaslight preference on Friday.

The Output of Coal Last Year.—According to a Parliamentary Paper which appeared on Saturday, giving statistics of the world's output of coal in the past year, the total was about 700,000,000 tons, of which two-thirds was produced by America and one-third by the United Kingdom. The following are the figures, in tons, of the five principal coal-producing countries: United States, 260,929,000; United Kingdom, 219,047,000; Germany, 108,000,000; France, 31,613,000; and Belgium 22,074,000.

The Regulation of the Supply of Water Gas.—The special meeting of the Gas Companies' Protection Association, to consider the line of action to be taken by them in connection with the Bill introduced into the House of Lords for the "regulation of the supply of water gas and other poisonous gas," was held yesterday afternoon. There was a large attendance—far larger than is usual at the ordinary meetings of the Association—and for quite an hour-and-a-half the question was discussed, and with enthusiasm. The proceedings were private; and it has been decided that there shall be no communication to the Press, presumably in order that through its medium there shall be no disclosure to those favourable to the Bill. Beyond saying that the meeting was thoroughly on the side of the well-understood object for which it was called, we shall remain loyal to the decision of the Committee.

A Cheap Incandescent Burner.—The Export Incandescent Lighting Company are offering a burner which they say will, in the matter of price, beat anything that has yet been introduced, and that will make the free distribution of these burners among gas consumers as light from the cost point of view as flat-flame burners. We have not seen the burner, and consequently have not tried one, so that we cannot either criticize or praise the production. However, the description furnished gives the information that the burner is brass throughout, and consists of two pieces only. One part contains the gallery holder, chimney guard, and injector, which has in its base a threaded orifice to take the adapter. The second part, which completes the bunsen, slides into the support, and fits hermetically. The air-supply orifices and the gas-injector, it is stated, have been adjusted so that the exact amount of gas and air necessary to produce a perfect bunsen flame is admitted. It is also asserted that the admission of the air in the base of the bunsen, instead of the sides, prevents any tendency to lighting back. The consumption of gas is placed at 2 to 3 cubic feet per hour at 1-inch pressure, which, with the ordinary "C" mantle, will give "a light of 80-candle power." The burner "can also be supplied to burn a 5-inch mantle to give 200-candle power." The claims are certainly great; but they can easily be tested by obtaining samples.

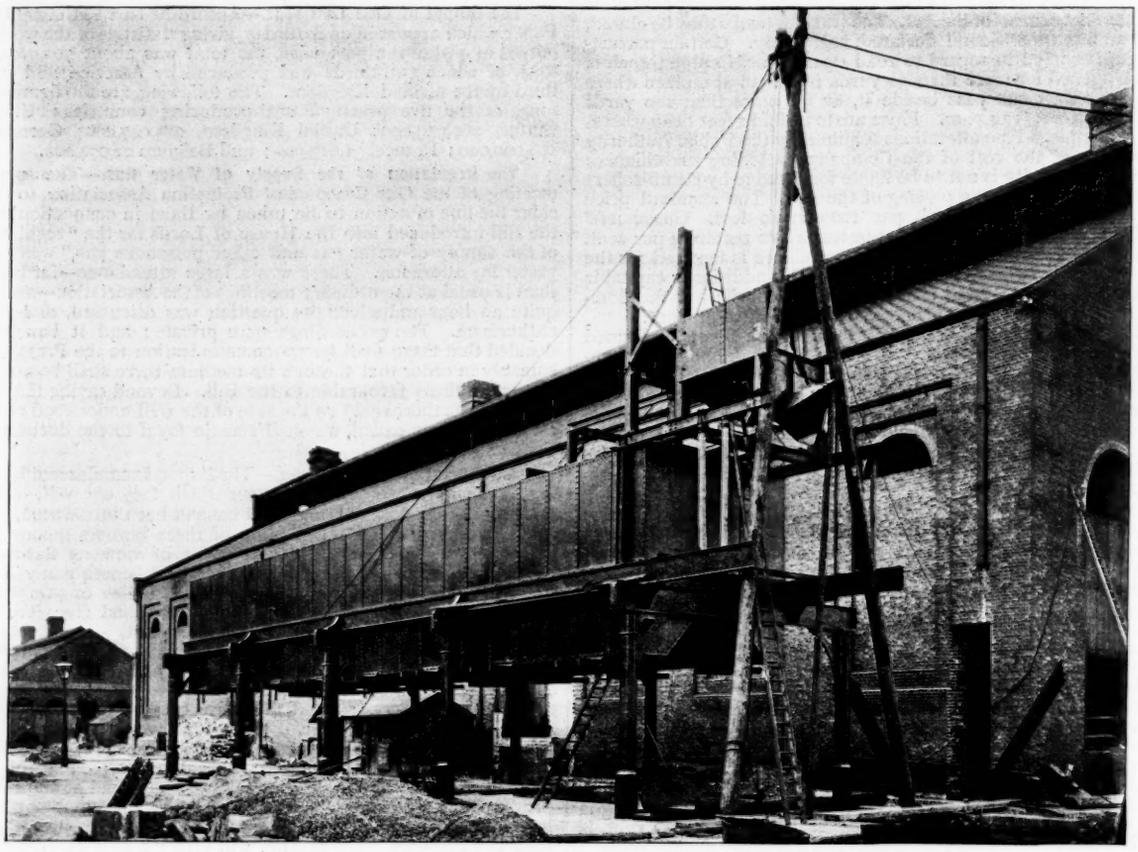
The Metric System in America.—The Decimal Association are circulating a report recently sent by the Secretary of the National Bureau of Standards at Washington to the British Consul-General in New York, dealing with metric weights and measures in the United States. In the course thereof, it is stated that in 1893, in accordance with the order of the Secretary of the Treasury, the metric prototype standards, the metre and kilogram, were adopted as the fundamental standards of the United States, from which the standard yard and pound were to be derived. All the States and territories of the United States have been provided, by order of Congress, with carefully-prepared copies of the metric standards. Congress authorized the signing of the Convention of 1875 establishing the International Bureau of Weights and Measures, for the construction, care, and comparison of the metric standards. The Association add: "It will be seen that the United States have taken a long step towards the adoption of the metric system, and, as far as their fundamental standards are concerned, they are to-day upon a metric basis. The Secretaries of the Treasury from 1847 downwards have repeatedly urged upon Congress the importance of adopting the metric system. The Committee of Coinage, Weights, and Measures, to which a recent Bill on the subject was referred for consideration, adopted a favourable report by 15 votes to 2."

MEETING THE DEMANDS OF THE TIMES AT CROYDON.

The most remarkable feature of our great gas industry is its never ceasing activity—notwithstanding its competitors—in expansion. The statement needs no qualification; the proof of the precedence of this feature being found in almost every town. Perhaps it is appreciated far more by one whose duty has required him, over a series of years, to visit works in almost all parts of the country where the accretion of business has demanded the addition, time after time, of producing and other plant, than it would be by an individual who has not the same opportunities of being brought into intimate contact with what is being done here, there, and everywhere throughout the land. The Croydon Gas Company's works are a good example of the growth that has taken place in the gas business in progressive suburban towns; and anyone who knew the gas-works (say) fifteen years ago has only to ramble through them to-day to fully comprehend, without figures or other aids, what has occurred in the meantime in the way of development, and what is fairly expected of, and what preparation must be made for, the future.

We well remember Mr. James W. Helps entering the Croydon Gas-Works in the year 1884 as their Engineer, and equally well does recollection serve as to the size and condition of the works in those days. The retort-houses were diminutive in comparison with a later erection; and they were equipped with direct-fired retort-settings. The purifying plant was small, and would have an undignified appearance if seen to-day in juxtaposition with plant which now exists. The older gasholders, still apparently of everlasting strength, are not in the running in the matter of capacity with the holder put up some seven years since. Changes, comparatively small at first, began to be made soon after the entry of Mr. Helps to office. A lift was added to one of the holders, a new washer-scrubber was put down, two tar and carbonic acid extractors were installed, a station meter of 100,000 cubic feet capacity supplanted two smaller ones, and new governors were substituted for old forms. Then came greater changes. Nine years ago witnessed the completion of a fine stage-floor retort-house, 196 feet in length and 72 feet wide, with a coal-store 50 feet wide at the side; and a couple of years later saw a new 3 million cubic feet holder brought into service.

But it is on the manufacturing plant that we have to concentrate attention in this article. As the then new retort-house was being inspected nine years ago, no one—save perhaps the Engineer—had any thought of the time so soon coming when the provision there



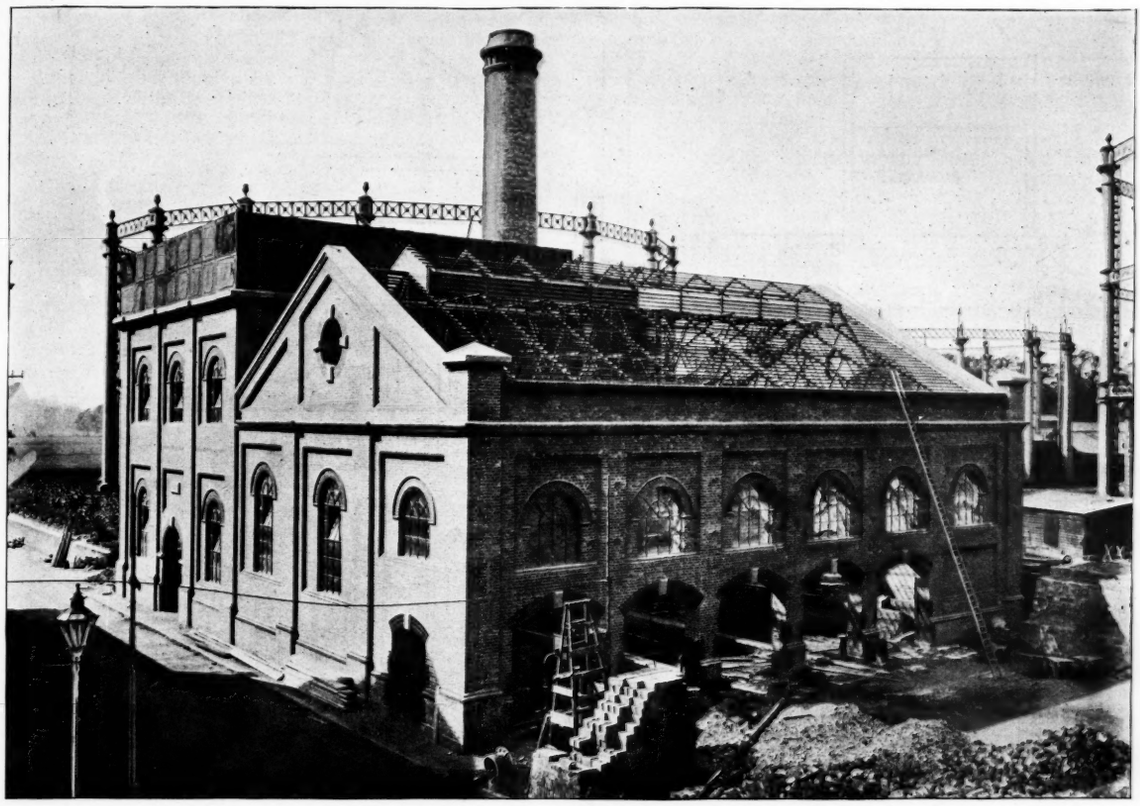
Coke-Hoppers and Railway Dock Underneath in Course of Construction.

and then made for production would be unequal to the demand. But the year was not far ahead when workmen were busy on the erection of a carburetted water-gas plant. Such was the progress, and such it has continued to be that further extensions have since had to be effected, besides which the exigencies of the times are rapidly bringing to completion means which will contribute to economical operation. And not only this. The finishing of present work will lead, through necessities of which signs are not even now wanting, to the gradual unfolding of a larger project which is already in a well-defined state. This roughly drawn picture of what has occurred within the limits of supply of the Croydon Gas Company is but an illustration of what is taking place throughout the larger industry of which this undertaking is but a unit. Its schemes for the future speak of bright prospects, and exemplify the process of constant solidification and expansion that is going on in the whole industry, and the promise of a long continuation of that happy condition.

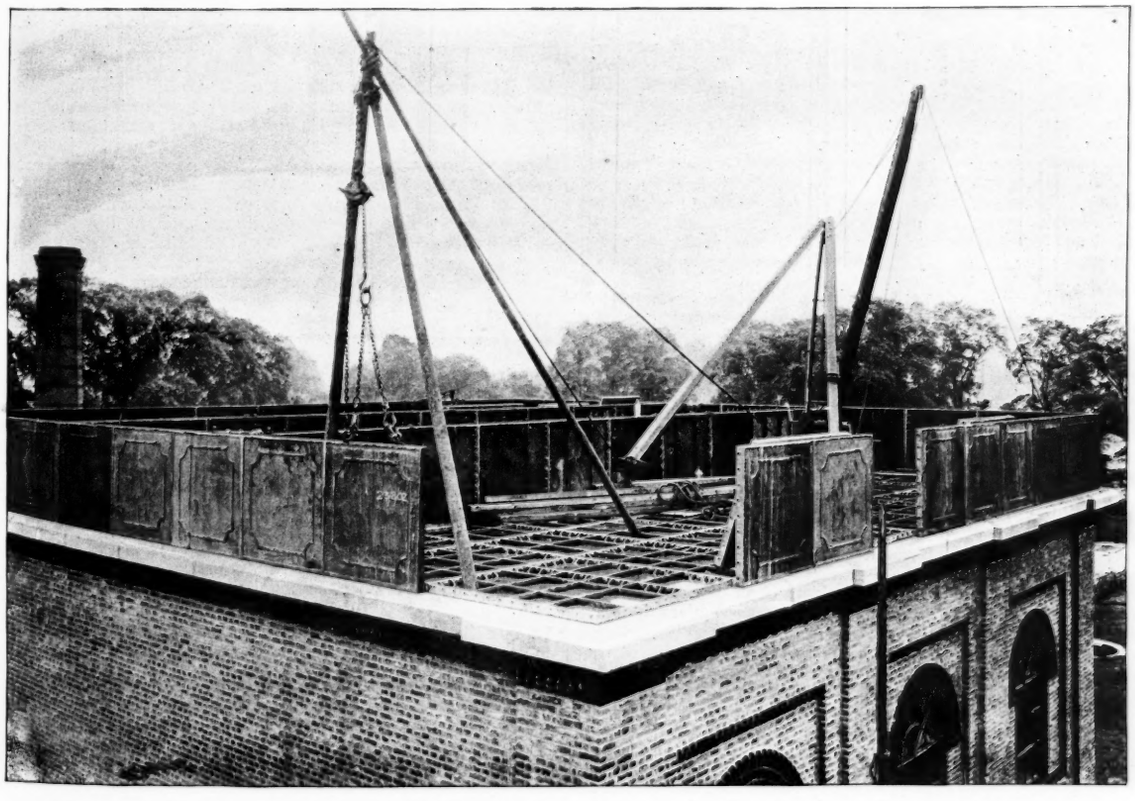
The General Scheme of Extension.

An intimate acquaintance over many years with the Croydon works, and consequently with their development, prompts the foregoing general remarks after a visit to see the work now in progress. But from the general we must descend to the particular in order to describe the new extensions, and the application of considerable additional mechanical methods to the retort-house and other operations. The description should be prefaced by explaining in a sentence or two that, when Mr. Helps received instructions from his Board to consider the question of extending the works, he went thoroughly into the question as to whether, under his particular circumstances, it would be preferable to adopt inclined retorts, or to extend the horizontal system and apply power charging and drawing machinery. He pronounced in favour of the latter. The retort-house constructed some nine years ago was only filled with settings to the extent of two-thirds—that is to say, while capable of taking fifteen settings, it contained only ten beds of eight retorts, 22 in. by 16 in. by 20 ft.; and these were charged by West's manual machinery. For his immediate requirements, he decided this year, with the consent of his Directors, to complete the equipment of the house by constructing a further five settings on the Klonne principle. This has been done by the Contractors—the Leeds Fire-Clay Company—and the new bench is now being heated up. As a point of interest, it may be incidentally mentioned that the other ten settings are constructed half on West's principle and half on Winstanley's. But in their general features the new beds are similar to the old ones. In the next section of his scheme, Mr. Helps intends to construct at the

THE EXTENSIONS AT THE CROYDON GAS COMPANY'S WORKS.

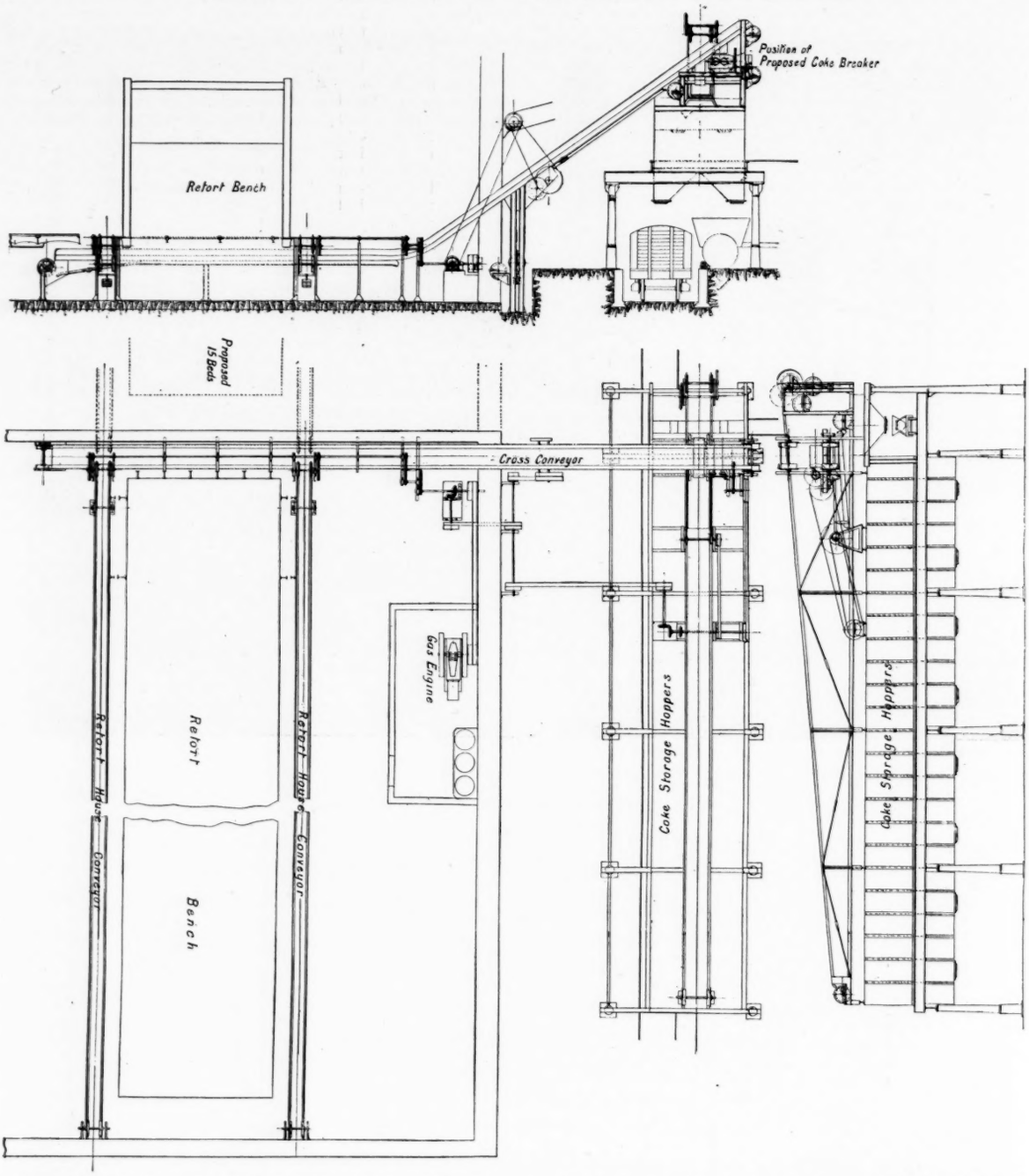


Block of Buildings, comprising Boiler-House, Compressor-House, and Water-Softening Room, with Water-Tank Above.



Photograph showing Construction of Water-Tank; First Tier of Side Plates being put in Position.

THE COKE-HANDLING PLANT AT THE CROYDON GAS-WORKS.



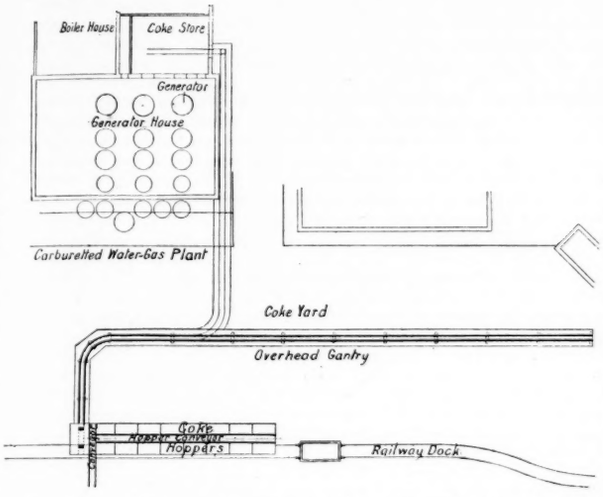
southern end of the house, a duplicate (without binding himself to details) of the present house; so that, to all intents and purposes, it will then form one long building containing thirty settings.

In much of the work that is now being finished, provision has been made for dealing with this extensive continuation of the present house. For instance, and more will be gathered on the point as the description proceeds, Mr. Helps has discarded the manual stoking machines, and introduced West's compressed-air charging and drawing machines—one pair to each side of the house; and these, although required at present to deal with only fifteen beds, will be capable of operating the whole of the projected additional fifteen settings, or in all thirty beds of eight retorts. Provision has also been made for the necessary boilers and air-compressors for the entire work, including the old retort-houses when altered; and these things point to the propinquity of the contemplated further extension of the producing plant. This may seem, on the first blush, to be looking far ahead; but it is not so when one gets an insight into future projects. This large retort-house, with its thirty settings and all the auxiliary plant, is intended to form one complete works independent of anything which may be done in the future. It is necessary that this section should be in working order to meet demands before the old-fashioned retort-houses can be dismantled. To fit them for present-day, economical methods of working—the installation of stoking machinery, and so on—it will be necessary to raise the roofs and make them wider; and therefore Mr. Helps contemplates by-and-bye constructing on their site practically a new retort-house which, with its accessories in the way of purifiers, scrubbers, and everything, will form another distinct works or section. Then, when these schemes arrive at the state of actuality, the works will be capable of producing 8 million cubic feet of coal gas a day, and about $2\frac{1}{2}$ million cubic feet of carburetted water gas. With three sets of water-gas generating plant (rated at 625,000 cubic feet each), the nominal producing power is nearly 2 million cubic feet; but when everything is in full work, and a fourth set added, to put the production at $2\frac{1}{2}$ million cubic feet is not passing over possible bounds into exaggeration.

In the Retort-House.—West's Compressed-Air Machinery and Coal-Handling Plant.

But let us return to the retort-house. The introduction of the West compressed-air machines and the erection of the additional five settings has necessitated a large amount of interior work. With regard to the settings, there is nothing special (beyond what has already been stated) to remark upon. It may, however, be noted as a point of interest that the hydraulic mains are suspended and not supported from beneath. There are several commending points about this method of carrying hydraulic mains. In comparison with the old benches, the arrangement is simple, and

there is nothing to impede movement about the tops of the settings. The suspension is made from girders above (connected to the buckstays, which also serve as supports for the coal-hoppers) by means of elongated straps affixed to the tops of the division-plates at the junctions of the sections of the hydraulic mains; and, at each point of suspension, adjustment of the levels of the mains can be readily performed. As in the older settings, tar-towers have been adopted for the regulation of the seal and the withdrawal of the tar. The new bench is provided with a chimney of simple construction—merely 9-inch brickwork, with angle-iron run up the full length at the four corners, and cross braced.



Elevated Trolley Lines from Coke-Hoppers to Storage Ground and Carburetted Water-Gas Plant.

The substitution of compressed-air stoking machinery for the manual type, among other work, called for the cutting out of part of the stage-floors for the accommodation of the rails; but, seeing that a coke-conveyor was being put in at the same time, this part of the work was not a matter of any great moment. The compressed air for the machines is supplied from a single-line two-stage air-compressor, which is fixed in the new compressor-house, hereafter referred to. In the retort-house, the compressed air is conveyed to the charging and drawing machines by means of hose, which is automatically wound on and off hose-drums; the latter being fixed in an overhead position to the girders supporting the hoppers. As already mentioned, for the present one charging and one drawing machine will operate upon fifteen settings of eights, or 120 mouthpieces; but when the house is duplicated, each pair of machines will operate upon thirty settings of eights, or 240 mouthpieces. All the work in connection with the stoking machinery and coal plant has been carried out by West's Gas Improvement Company, Limited.

Regarding the coal plant for feeding the machines. Of course, the same plant that furnished the coal for the manual machines which fed the ten beds sufficed, with certain alterations, for the power ones; and the new work in conjunction with the new bench is represented by the addition of a double hopper on both sides of the bench, a coal-breaker, engine, elevator, and a cross conveyor. There is a noteworthy point in connection with the new coal-breaker and elevator. In the case of the original portion of the plant, the engine and the breaker are accommodated together practically underground in the coal-store; and Mr. Helps finds that one of his greatest difficulties is caused by having the engine in the midst of all the flying dust and dirt, and the trouble of getting at it in that position for repairs. Profiting by his experience, he has, in the new plant, had the engine erected on girders in the coal-store a little higher than the retort-house stage-floor; and there it is to be properly housed in. In this situation it will be accessible, and not exposed to the injurious effect of dust and dirt. The breaker, of course, is in the pit below; but seeing that the engine is half way up the elevator, a shorter belt will be required for driving the elevator than if it was operated from the foot. The coal-hoppers in the retort-house have a capacity of about 20 tons each, and are fixed in convenient positions so that there is a minimum amount of travelling to and fro of the charging-machines for their supply of coal. In designing the coal plant, Mr. Helps's aim has been to have it of sufficient capacity to obviate its operation during the night eight-hour shift.

The De Brouwer Conveyor and the Exterior Coke Plant.

The other new introduction in the retort-house is the De Brouwer coke-conveyor, which is being laid down on both sides of the house by Messrs. W. J. Jenkins and Co., of Retford. Both longitudinal conveyors deliver on to a cross conveyor, which transports the coke to storage hoppers outside. (The whole of the new coke-handling system will be seen at a glance in the drawings which accompany this description.) About the arrangement of the outside coke plant, there are a few points which bring into prominence the independent reasoning of the Engineer, and his refusal to slavishly follow former practice if it does not accord with his view. Running in the yard the full length of the retort-house is a railway dock, along which railway waggons can pass for unloading material or loading with coke, as the case may be. At the southern end of this dock (as illustrated by the photograph) are large overhead coke-hoppers, capable of holding 120 tons of coke. These hoppers are fed by the De Brouwer conveyor.

Now when Mr. Helps was looking into the question of coke-conveying plant, it seemed to him that a good deal of the objectionable breaking up of the coke was caused by the great heights from which the coke is dropped, and that this was generally rendered necessary by the fact that the coke-screens ordinarily used have to be fixed at an angle (say) of 45°. If the coke has to run down a screen fixed at that angle, then it has to be elevated to the height (say) of 45 feet; but if that type of screen can be satisfactorily supplanted by some other, it is possible to considerably reduce the great height to which the coke has to be carried. This being his view, Mr. Helps gave his preference to a jigging screen, so that the elevator feeding it has only to rise about 25 feet. This jigging screen is so arranged that it will deliver the breeze into the first compartment of the series of hoppers, the broken coke into the next, and the large coke, carried by the conveyor (which runs the full length of the hoppers), into further divisions.

Another point that is noticed is that Mr. Helps has in his plans minimized machinery, with its consequent breakdowns, as much as possible. It is where there are large lengths of conveyors, and sometimes quite a series of cross conveyors going out into the yard to stock coke, that breakdowns are more frequently expeperienced. In the large hoppers, and by the short length of conveyor he has leading to them, he will be able to deal—with occasional exceptions—with the bulk of his surplus coke. But for those exceptions, and for the feeding of the carburetted water-gas plant (as shown on the small drawing), he has put up another hopper at the end of the large hoppers, but at a slightly higher elevation. This hopper will deliver from the bottom into small trolleys, which will run on an elevated gantry, and deposit the coke on to the storage ground, or along a branch to the operating-floor of the water-gas plant, so that the coke will here be run directly to where it is wanted without the assistance of a conveyor or a lift as is almost general. A boy will be able to perform the small amount of occasional labour required for this; and, by the means adopted, a lot of moving machinery is avoided.

A further cause of coke breakage is traceable to empty hoppers, and the dropping of the coke on to the iron surfaces. Mr. Helps is going to adopt the rule never to allow the hoppers to become completely empty; so that the coke will not have a great height to fall from the conveyor, and will drop on to coke, instead of iron.

Boiler-House, Compressor-House, Water-Tank, &c.

Facing the plant just described is a block of new buildings, spacious and lofty; and of substantial construction. In design and general appearance—being built of yellow brick with blue brick facings and quoins—they conform with the style of architecture in the newer parts of the works. One of the photographs shows these buildings, in which are to be concentrated much of the machinery connected with the new and future plant. In the boiler-house, for example (which consists of the whole of the front part of the building), are now being installed two steam-boilers, 28 ft. by 8 ft., intended for the present and future supply of the compressed-air machinery feeding the stoking plant put down in the existing retort-house for its service and the proposed extensions. When these boilers (which are by Messrs. Heaton, of Manchester) are at work, the two boilers now in use for the water-gas plant will also be removed to the new house; and another boiler is to be established as a stand-by—that is to say, in all there will be five boilers. The house is 73 ft. 9 in. by 49 ft., and 25 ft. high to the shoe. Both the boilers now being placed in position will be required for the air-compressing plant when the whole is put down and at work. In connection with the boilers, Gosling furnaces and Green's economizers have been adopted. The large chimney shaft, the top of which will be seen towering above the buildings in the picture, is 90 feet high, and its least internal diameter is 5½ feet.

Another part of the block of buildings consists of a compressor-house, with water-softening room above; the whole being surmounted by a large water-tank, as seen in the illustrations. The compressor-house is 43 feet square and 40 feet high to the underside of the water-tank. West's Gas Improvement Company have put in one of their single-line, two-stage air-compressors; and the foundations are being laid for an additional two. In one corner of the house, there is to be another compressor for the Murray air-lift process, which is going to be used, instead of deep-well pumps, for the raising of water from two artesian wells on the works. The room above, for the accommodation of water-softening plant; is formed with a floor which looks as though it will be capable of standing any weight. It is composed of steel joists, with strong corrugated iron centres, and is to be filled in with concrete. The tank above, at the height at which it is situated, will supply water to any part of the works. It is 9 ft. 6 in. deep, 48 ft. square, and has a capacity of 110,000 gallons. It is divided into three compartments—one for softened water, the other for unsoftened water,

and the third for water which will be good enough without treatment for the rough purposes of the works—such as coke quenching. The artesian wells are already in existence. They are carried to a depth of about 400 feet; and by means of the Murray air process, it is hoped to get sufficient water to make the works independent of outside service.

The Contractors for the ironwork in connection with this group of buildings were Messrs. Ashmore, Benson, Pease, and Co., and for the brickwork Mr. Page, a local Contractor.

Carried out under the critical eye of the Chief Engineer and General Manager of the Croydon Gas Company, it is superfluous to say that the work described in this article has been, and is being, thoroughly executed; and when the time arrives for the further prosecution of the plans, which the development of Croydon and the district and the consequent inflow of new business to the Gas Company must necessitate, we know (on their completion) there will be found at Waddon a works which will vie in their embodiment of good engineering, in resultant work, and in economy of capital employed, with the best of the gas plants of our times.

The photographs accompanying this article, which enable us to illustrate the descriptive matter so well, are by Mr. Helps's Chief Draughtsman (Mr. F. Harrisson). It should be mentioned that they were taken during the progress of the work, and so show it in an incomplete state. We are sorry that the weather has not been favourable for obtaining a good photograph of the interior of the retort-house to illustrate the extensions there, the installation of the West compressed-air stoking machinery and the coal-handling plant, as well as the De Brouwer conveyor. The section of the work described in the present article is expected to be completed to the necessary extent for the winter's work in the course of this month.

ELECTRIC LIGHTING MEMORANDA.

The Board of Trade Returns—Companies and Local Authorities—Who Does the Public Lighting—Municipal Electricity Capital is Dear—The injustice to Ratepayers.

THE Board of Trade returns relating to authorized electricity-supply undertakings in the United Kingdom, which were dealt with in last week's "JOURNAL," have naturally attracted particular attention in other quarters. Coming as they do in the midst of the controversy that is going on over the question of municipal trading, they have been seized upon for the sake of whatever evidence can be deduced from them in support of the contentions of the two parties to this polemic. First and foremost, of course, they were quoted in "The Times" as early as we were able to publish the figures—that is to say, last Tuesday; and this is the net result as given by our contemporary: Of the undertakings belonging to Local Authorities, 109 showed loss; only 40 showed any net profit at all after providing for interest and sinking fund payments. The total capital expended on electricity-supply undertakings by Local Authorities to the end of 1900 amounted to £14,943,122—say, roughly, £15,000,000 sterling. On this, there was a net loss, after providing for interest and sinking fund, of £102,931. "The corresponding return in respect of Companies shows that of these 13 admitted a loss and 49 declared a profit; the net profit for the year, on a total capital expenditure of £10,954,188, being £321,880." We repeat the statistics by way of supplementing our own statement. After the facts, the explanations. A correspondent of "The Times" very justly claims that those municipal undertakings which have been supplying electricity for a short time only should not be included in a general statement designed to give a bird's-eye view of the result of municipal trading, remarking that interest and redemption charges usually accrue in the case of such ventures before the works are in a revenue-earning condition. The objection would be more serious, however, but for the circumstance that the majority of the losses incurred relate to undertakings of respectable age.

The "Electrical Review" chimes in very effectively with the observation that these returns, imperfect as they are, show what enormous benefits the ratepayers of British towns and districts are *not* obtaining by the public operation of electric lighting stations. It proceeds to point out, very fairly, that sixteen out of the Electricity Supply Companies included in the return are Metropolitan concerns, and, consequently, exceptionally favoured for carrying on a profitable business. Yet four out of these confess to losses. Taking the whole number together, they only earn 3·8 per cent. profit on the capital employed; and this is the extent of the glorious gains of these favoured sixteen London Electricity Supply Companies, which so excite the covetousness of municipal traders. As to the undertakings carried on by Local Authorities in all parts of the kingdom, the amount which was placed for the year to the credit of reserve was about £33,600. There is no municipal depreciation fund column as such, although in one or two exceptional cases surpluses are so allocated. Among other points noted by our electrical contemporary is the significant fact, to which we called attention in last Tuesday's "JOURNAL," that whereas companies receive very little from public lighting, in the case of some of the municipal supplies public lighting brings in nearly as much as, and in some cases even more than, the revenue from other sources. Examples are cited. At Barking, public lighting receipts are given as £1744, and the other receipts are £2152. The loss here is £1006; and the Local Government Board are insisting on the Barking Council wiping off the loss in the next rate, instead of allowing it to accumulate further. Cheltenham gets £4370 from public lighting, and £5716 from other business, with a resulting loss of £3638 after providing for interest and sinking fund. At King's Lynn, the public lighting brought in £1899, and the other sales £2002; and there is an admitted deficiency of £1068.

Of course, this is far from being the complete story. Even where municipal undertakings allege that they do a certain volume of business other than street lighting, an unknown quantity of it could be traced to municipal buildings, schools, asylums, and workhouses. All this kind of public lighting is grist for the municipal mill, whereas a company might whistle for it. Even where the street lighting is placed to the credit of the municipal electricity supply undertaking, it is not always to its advantage. Our electrical contemporary argues that electric street lighting in itself is such a vast improvement of any locality, that it ought to be properly paid for by the public departments concerned, and should not be palmed off at so low a nominal charge as to be a burden on the station instead of a help to its finances. Finally, it is remarked as being "not a little curious that public lighting is far more extensively employed where municipalities supply themselves than where companies are the undertakers." There is, surely, no mystery about this. Public street lighting is not wanted by companies, except at prices which Local Authorities as a rule will not pay. The municipalities usually do it themselves for the sake of starting their new stations with something that looks like trade; and then they distribute the cost so that the ratepayers shall not take alarm at it. As to such a question as the provision of adequate depreciation on this enormous amount of municipal investment, the least said about it the better. Everybody knows at the back of his mind that this particular variety of municipal "reproductive" enterprise has not answered the expectations formed respecting it; and the practical impossibility in most cases of providing adequately for depreciation is to an extent an admission of disappointment.

Partisans of municipal trading now seek to put a good face upon the facts by arguing that Local Authorities are at a disadvantage in carrying on electricity supply undertakings as compared with companies, because they have such a "heavy debt service." This is a change of ground, with a vengeance; for it used to be put forward, as the chief reason for the undertaking of this kind of enterprise by Local Authorities, that they could obtain the necessary capital at a cheap rate. There have always been those who pointed out that the apparent cheapness of municipal capital was illusory, and especially had to be taken with the rigid conditions attached to it; but we were flouted and set at naught. Now the municipal traders are feeling the pinch of trading on borrowed money. Many of them, as has often been pointed out, are persons with no experience of business on a large scale; and their fervid admirers are usually newspaper writers with no knowledge of finance or industry at all. It has thus been, and still is, a case of the blind leading the blind into the ditch of what, barring the rates, would be insolvency. There is no sense in the plea that if it were not for the interest and sinking fund payments municipal electricity supplies would show profit where they now confess losses; for the conditions were perfectly well known in advance. One apologist observes pathetically that municipal interest and sinking fund payments average more than 6 per cent. on the capital expended. True; but this is no new discovery. It is one of the bottom facts of the situation, upon which the opponents of unnecessary and uncalled-for municipal dabbling in this business laid all possible stress from the very first. There is no electric lighting company in existence that would not be satisfied with a 6 per cent. profit on its investment, to say nothing of the security of the rates.

The partisans of municipal trading, moreover, are not content with cutting the ground from under their own feet in this way. The belated discovery (for them) that municipal capital is not cheaper, but dearer, than private capital, might be regarded as accounting for the whole of their disillusionment. They go on, greatly daring, to contend that although Local Authorities pay more for their capital than companies do—how strangely this complaint sounds!—they produce electricity more economically, and sell it at a much cheaper rate than the companies. The answer to this amazing argument for municipalization is that it is a pity the ratepayers did not understand all along the purpose with which their representatives intended to go into trade. As a rule, we believe, these misguided people were promised a profit in aid of the rates. Now they are told they ought to be pleased and proud that a few of their number get electric lighting for less than cost price, and should gladly put their own hands into their pockets to make up the difference. The plea seems ludicrous; but it is quite seriously advanced to account for the existing unprofitableness of municipal trading. By simply charging as much per unit as the companies do, Local Authorities could, we are assured, turn their deficit into a handsome surplus. Then why is this not done? What law is it that stands in the way of such a measure of simple fairness to the ratepayers? Not law, indeed, but "Progressive" vanity, is the obstacle here.

PERSONAL.

Mr. H. E. JONES, as the proceedings at the Commercial Gas Company's meeting, reported elsewhere, state in some detail, retires at the end of the year from the position of Engineer and General Manager to the Company, and will be succeeded by his son, Mr. STANLEY H. JONES, now and for some time past Assistant Engineer in the Company's service. Mr. Jones was so long ago as 1869 Engineer of the Ratcliff Gas Company, afterwards amalgamated with the Commercial Company; and he succeeded his father, the late Mr. Robert Jones, in the position of chief officer of the united undertakings. Upon his retirement from his present office, which he has filled with a degree of distinction and a measure of success recognized in appropriate terms by the Chairman of the Company (Mr. W. G. Bradshaw), and the Board, Mr. Jones will take the Director's seat vacated by the late Mr. E. T. E. Besley.

Mr. CORBET WOODALL has resigned the appointment of Consulting Engineer to the Imperial Continental Gas Association, which he has held for about fifteen years, and has joined the Board of the Association, succeeding to the seat vacated by the death of Sir J. M. Carmichael. Mr. Woodall's retirement from the arduous and responsible post in which he has rendered most valuable services to the Association during a critical period of the development of this great undertaking, was fittingly marked by the passing of a eulogistic resolution by the Board. The position vacated by Mr. Woodall will not be refilled, as the intention is that he shall still continue to exercise a general engineering supervision over that portion of the work of the Association which will be done in London. It is gratifying to know that this change in Mr. Woodall's relations with the Imperial Continental Association has not been dictated by any consideration of failing health, or from any other personal reason beyond the desire to be relieved from a heavy tax upon time and the strain of responsibility for much detail work abroad.

Mr. CHARLES HUNT, M.Inst.C.E., has opened offices at No. 15, Victoria Street, Westminster.

Mr. R. BRUCE, formerly Gas Manager at Lockerbie, has been offered and accepted the position of Manager to the Moffat Gas Company.

Mr. WINTER, who was Chief Assistant to the late Surveyor of Darlington, has been appointed Borough Surveyor and Water Engineer to the town, at a salary of £350 per annum.

The Halifax Corporation Water Committee have promoted Mr. R. J. HARTLEY to the post of Water-Works Engineer, and Mr. GRISDALE to the post of Deputy Water-Works Engineer.

On Wednesday last, Mr. W. CROSS, the Manager of the Stepney station of the Commercial Gas Company, was presented with a purse of money—the subscribers, who numbered about 300, including his fellow-officers and men. Mr. Cross is retiring upon a superannuation.

As the outcome of the resolution referred to in our "Personal" column on the 23rd ult., the Exeter City Council decided, on Wednesday evening last, to confer the freedom of the city upon Mr. H. A. WILLEY, in recognition of his services in connection with the establishment of the Manual School. Mr. Willey's father, who served the city as Mayor and in other capacities, would have been elected a freeman but for the sad circumstance of his death just at the time when the bestowal of the honour had been decided upon.

The Cheltenham Gas Company Cricket Club, who made their *début* in the past season, held their first annual dinner on Monday of last week; and opportunity was taken of the occasion to make two interesting presentations. The health of Mr. R. O. PATERSON, the President of the Club, having been enthusiastically toasted, he was presented, on behalf of the members, with a handsome framed photograph of the team. In returning thanks for the gift, Mr. Paterson said it had always occurred to him that a connecting link between the men in the offices and those in the works was needed; and he thought the Cricket Club had served the purpose. At a subsequent stage of the proceedings, a travelling bag and framed photograph of the Club were presented to Mr. G. P. CURRY, who, after six years' service with the Company, is leaving to take up an appointment at the Hong Kong Gas-Works. The presentation was made by Mr. Paterson, who eulogized the work of Mr. Curry while at Cheltenham, and wished him every success in his new sphere of operations. Mr. Curry suitably returned thanks for the gifts.

It will be seen by the report which appears in another part of the "JOURNAL" that Mr. ALEXANDER YUILL, of Alloa, has been appointed Engineer and Manager of the gas undertaking of the Dundee Corporation, in succession to Mr. W. M'Crae, who resigned the position last June. The successful candidate, out of the 35 applicants, is 49 years of age, and has been Manager of the Corporation gas undertaking at Alloa for fifteen years; and the recently created electrical undertaking is also under his charge. In addition to being Gas Manager, Mr. Yuill has been the Engineer for all the alterations and extensions made upon the works, and also Consulting Engineer for the erection of new works at Carluke, and for extensions at Motherwell, Kilsyth, and other places. He is one of the recognized experts in the valuation of gas-works for transfer purposes. At Alloa, the works have been remodelled and extended according to plans prepared by him, at a cost of upwards of £20,000. The consumption of gas has more than trebled, and is now upwards of 80 million cubic feet per annum. When he went to Alloa, the price was 3s. 9d. per 1000 cubic feet, with meter hires, while it is now 2s. 4d.—the cheapest gas in Scotland—and meter-rents have been abolished. Mr. Yuill was one of the first gas managers to adopt the Peebles process of oil-gas enrichment; and he has also been one of the first to adopt the method of enrichment by benzol. It may be remembered that he read a paper on the latter subject at the meeting of the North British Association of Gas Managers in Glasgow last year. He has gained "honours" in practical chemistry, and holds certificates in building construction and engineering. We congratulate him on his appointment, and cordially wish him success in his larger sphere of labour.

On Monday of last week, upwards of 200 of the officials of the Liverpool United Gaslight Company assembled at the Duke Street offices for the purpose of participating in a presentation to Colonel J. F. ROBINSON, the Treasurer of the Company. Colonel Robinson has been associated with the undertaking for thirty years; and the national rejoicings which have lately taken place suggested to the staff working under him that a fitting occasion had arisen for some recognition, not only of generous treatment, but of the kindly consideration in which all branches of the department had shared. In addition to a beautifully illuminated address, Colonel Robinson was the recipient of a very handsome oxidized silver equestrian statuette of himself in the capacity of a Volunteer officer. The address conveyed to Colonel Robinson expressions of high appreciation of the manner in which he had administered the Treasurer's Department of the Company, of thanks for his efforts on behalf of the staff—more particularly with regard to the foundation of the superannuation scheme—and of the earnest hope that the cordial relations which had so long continued between the chief and the staff would be maintained for many years to come. To Mr. Charles Greenwood, the Chief Clerk, was allotted the duty of making the presentation. In a few happy sentences, he asked Colonel Robinson's acceptance of the gifts, which, he said, were an outward sign of their appreciation of thirty years' able, considerate, and satisfactory conduct of the control of the Treasurer's Department. Colonel Robinson's *régime* had been marked by many reforms from which the staff had benefited, particularly in the matter of superannuation and holidays. Mr. William King, on behalf of the engineering staff, added his congratulations to Colonel Robinson; and appropriate remarks were also made by other speakers. Colonel Robinson acknowledged the presentation in feeling terms. No one, he said, recognized more than he did the great assistance which he had received from the staff; and no one was more surprised than he was at receiving such an exhibition of good feeling towards himself. During the thirty years he had been associated with the Company, many changes had taken place; but he believed that the success of the undertaking had been largely due to the loyal co-operation of the staff, and their courtesy and attention to customers. He assured them all that their presents, so unexpected, would be highly appreciated by him as long as he lived.

OBITUARY.

The death occurred at Hayling Island, last Sunday week, of Mr. H. R. TRIGG, the promoter and proprietor of the local gas-works. Deceased, who was born in 1831 at Kingston-on-Thames, was an architect and surveyor by profession.

Mr. THOMAS SMITH, the Borough Surveyor of Darlington, died last Saturday week at a comparatively early age. Since the early part of the year, he had suffered from an affection of the heart, and had in consequence been granted leave of absence. It will be remembered that for a considerable time Mr. Smith acted as Gas and Water Engineer for the borough, in addition to his other duties.

Mr. JAMES BARROW, a well-known mining engineer, of Maesteg, was taken ill while travelling in a railway carriage early last Tuesday morning, and died at Chester before medical aid arrived. Deceased was an active promoter of the Llynvi Valley Gas-Works, of which he was Managing Director at the time of his death. He was also the promoter and a Director of the Ogmore Gas and Water Company.

Alderman HENRY SUGDEN, who had been a member of the Brighouse Town Council since the incorporation of the borough, and for many years held the position of Chairman of the Gas Committee, died last Tuesday. Up till the latter part of the previous week, Mr. Sugden appeared to be in his usual health, and took an active part in business and public affairs; but from Friday he was confined to bed, suffering from perforation of the bowels. On Saturday, an operation was found necessary; but unfortunately deceased never rallied.

NOTES.

The Cleaning of Glass Globes.

Now that gas companies are required to stock a good deal of glass for use in connection with incandescent gas lighting, the following hints from the "Ironmonger" as to the keeping of such stock clean may be useful. It is admitted that glass is apt to go dull with keeping, and abundant washing in cold water is recommended as the best renovator. Plenty of water should be used, and the articles allowed to drain dry after it without wiping. Globes that have been much handled or dusted with dry dusters will sometimes be troubleseme to get quite clean with cold water; and if hot soda-water will not remove the finger-marks and dirt, a good way is to use diluted hydrochloric acid by means of a mop. After this acid treatment, the glass should be plunged into a bath of fresh water before the acid has time to dry. When glass with ground surfaces has to be much handled, it is a good plan to train the assistant in the habit of always holding the article by some part which is not ground. There is nothing like so much ground or frosted glass used as formerly; but it is very delicate stuff to handle, and, when it gets dirty, has a very dismal appearance. All glass that has been well washed will be clearer if left to dry than if wiped with a cloth. If time and room for drying cannot be spared, a box of sawdust will absorb superfluous moisture, and then the glass can be finally dusted. Particular attention to this matter is one of the essentials of success for a gas-fitting department.

Comfortable Temperatures for Interiors.

The approach of cold weather sends the public to the thermometer for guidance as to the lighting of fires or turning on of gas and hot-water heating arrangements. Attention has often been drawn to the different standards of sufficiency for the warming of interiors prevailing in England and in the United States and Canada. It is customary there for the artificial warming of buildings to be based on the requirement of maintaining an inside temperature of 70° Fahr. in "zero weather"—meaning, of course, when the outside temperature is down to 0°, Fahrenheit scale. This datum is not so simple as it looks; for the reason that the prevalence of wind or its absence may make all the difference in the refrigerating power of outside air. Since, however, actual zero weather is not very common even in the Northern States of the Union or in the settled parts of Canada, the requirement to provide for it means usually an ample reserve of heating power. In any case, Americans and Canadians are not satisfied unless their houses and offices are maintained at a minimum of 70° during the cold season; and this is very often increased to 80°, and even more. The reason why these high temperatures are not felt to be exhausting is because of the Continental dryness of the air. In an island climate, like that of the United Kingdom, such extremes of temperature are neither liked nor experienced. It rarely becomes the experience of any inhabitant of these islands to see the thermometer down to zero outdoors; although this occasionally happens for short periods of hard frosty weather. On the other hand, indoor temperatures artificially raised to above 60° Fahr. are not liked, even by inmates occupied in sedentary employments. The traditional rating of 55° Fahr. as "temperate" only applies to outdoor temperatures, or to interiors in which fairly active employments are to be carried on, or numbers of people assembled. Libraries, studies, and private offices and living-rooms occupied by more than one or two persons are not considered comfortable when the temperature falls beneath 60°. In the English climate, a little addition of artificial heat to a well-built interior usually suffices to procure this condition for the greater part of the season.

The Fatigue of Structural Steel.

Some years ago, constructors of works in steel were much exercised over the question of the deterioration of the strength of the metal from fatigue. Seeing that steel is only used in structures for the sake of its strength, and that unless this quality could be fairly relied upon for the life of the structure the only reason for the use of steel for the purpose would disappear, the anxiety of constructors on this score was intelligible. Such phenomena as the sudden breaking of steel tie-bars in bridges and viaducts or of steel main shafts in steam vessels were attributed to this mysterious influence of fatigue. As time has passed, however, scepticism in this respect has arisen and made headway. The whole subject was recently discussed in the "Engineer" in a very rationalistic vein. The suggestion here put forward is that the brittleness of steel is something unaccountable, which we shall always have with us. However carefully the specification may be drawn, however trustworthy the makers, however conscientious the testing, "there is always something lacking from absolute assurance that the shaft or bolt will not suddenly break asunder and perhaps lead to disaster." It would not be too much to say that this fairly expresses the average engineer's idea about structural steel. There is a million-to-one chance that it will fail without reason, under a stress far below its elastic limit; and this chance the modern constructor has to take. Such accidents do happen; and in most cases their characteristics are the same. No great fault can be charged either to the maker or the user of the material. On examination, the specimen is pronounced to be defective—as is probably the case with a great many pieces that remain in service without anybody being the wiser as to their secret defects. The fracture is usually "crystalline," whereupon everybody is thankful that no more harm resulted; and it is assumed that the piece must have been of a different nature when it was new. This is an unsatisfactory conclusion; and the probability is that it is not a correct one. The greater probability is that the fatigue or alteration of the physical character of structural steel in use is not so common as the employment of faulty material, and that breakages are most frequently due to the accumulated effect of strain upon a substance originally crystalline, though the condition was masked and unsuspected.

TECHNICAL RECORD.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.

Half-Yearly Meeting at Wallsend.

The members of the North of England Gas Managers' Association held their fifty-first half-yearly meeting in the Masonic Hall, Wallsend, last Saturday. There was a very large attendance, the acceptances numbering nearly 150. Mr. W. B. Walker, Engineer and Manager of the Walker and Wallsend Union Gas Company, the President for the year, was in the chair.

The Hon. Secretary (Mr. H. Lees, of Hexham) intimated that he had received a telegram from Mr. J. H. Penney, of South Shields, the late Hon. Secretary of the Association, stating that he was confined to the house; and not being able to be present, he sent his best wishes for the success of the meeting. Apologies for absence had also been received from Mr. Matt. Dunn and a few others.

Welcome to the Association.

Alderman W. Boyd (Mayor of Wallsend) said he had been asked by his very old friend, Colonel Crawford, the Chairman of the Gas Company, to join him in giving a welcome, on behalf of the Corporation and the inhabitants of Wallsend, to the members of the Association. He need hardly say that it gave him very great pleasure to respond to the invitation, and to acknowledge the compliment that was conveyed by the wish that the Corporation should be represented on the occasion. As the members knew, the new burgh of Wallsend had gone ahead lately with somewhat rapid strides; and he was sure that not the least interesting event during the first years of its existence as a Corporation would be the visit of that Technical Society to see what they had to show in the district. They might also, no doubt, be aware that they were—not municipally, but as a town—very much interested in electricity. He did not know whether they would have an opportunity of travelling on the electric cars which had been lately inaugurated; but he remembered, a good many years ago now, when electricity first came to the front, that many timid people who were holders of gas stock were very much afraid that they were going to lose their fortunes. He thought there could be no doubt that the fears which they then had were unfounded, and that the holding of this stock was as good an investment now as it ever was before—indeed, perhaps it was better. The reason for this was that the competition, and the endeavours to utilize and economize, had been fostered and encouraged by the rivalry which had existed in the employment of the two different systems of lighting. And whereas, probably, in the first instance, these two systems had their origin for lighting purposes, it was very remarkable how, in late years, both of them had diverged, and had gone on one side into other purposes. While electricity had been used for motive power, in addition to lighting gas had been employed for cooking and heating (and the bye-products in a great variety of other directions), in which its value had been found; and he was perfectly sure that the efforts which would be made by the directors and managers of gas companies to encourage the use of their products would be found to be not only of great benefit to themselves, but also to the public and to the communities who made use of them. He would only add that, so far as Wallsend was concerned, they offered a most cordial and hearty welcome to the Association, who had honoured them by their visit. Anything they had to show which was likely to be of interest to them was very much at their service. He hoped that the meeting would not be unsuccessful, and that the members would go away with a favourable impression, if not of the beauties of Wallsend, at any rate of the enterprise of the town, and of their desire to be in the forefront of municipal corporations.

Colonel Crawford, Chairman of the Gas Company, said that, in the first place, he had to thank Alderman Boyd, as the Mayor of Wallsend, for kindly complying with the request to come there and give a welcome to the Association, and also for proceeding, as he had just then done, to deliver a short address. He (Colonel Crawford) had, on behalf of the Walker and Wallsend Union

Gas Company, also to give the members a very cordial welcome. He thought it was the first occasion on which they had met in that district. They had hoped the new office they were building would have been ready for receiving them; but, unfortunately, the contractor had not kept his engagements, and they were being accommodated very nicely in the Masonic Hall. He remembered the Rev. John Robertson, who was a clergyman in Wallsend who used to give lectures, delivering one on electricity, which he produced by means of a glass disc. One thing which the lecturer said struck him then, and it had been in his (the speaker's) mind since, was that, although electricity seemed to be a very small agent at that time, he had no doubt that in the course of years it would be a very powerful and useful one. He thought they would agree with him that this prognostication had been correct. He need say nothing more, as their time was valuable; but he cordially welcomed them to the town.

The PRESIDENT, on behalf of the Association, thanked the Mayor for his words of welcome—a welcome which he said they appreciated all the more as it was, he believed, the first he had offered in his civic capacity. But they appreciated it not only on that account, but also because of the great interest his Worship took in all technical matters. He had also to thank Colonel Crawford, in their name, for his words of welcome, and for the excellent arrangements he had made for the meeting. Their business would necessarily be contracted, on account of the visits to works they were to make; but he hoped that what they would hear and see would be of interest to them all.

NEW MEMBERS.

The following were admitted as members of the Association: Allan, Alexander, Scarborough; Bates, W. A., Dipton, Durham; Merrill, J. J., Jarrow.

PRESIDENT'S ADDRESS.

The PRESIDENT then delivered the following

INAUGURAL ADDRESS.

Gentlemen,—In taking the presidential chair of this most important Association, one of my most pleasing duties is to congratulate the members upon its continued prosperity. I am deeply sensible of the importance of my position and of my duty to do what lies in my power to maintain that prosperity; recognizing that much of the past success is not only due to the individual efforts of my predecessors and their colleagues while in office, but to their continued interest in, and desire to promote the welfare of, the Association. I would gratefully acknowledge the assistance of the Committee, feeling as I do that the duties of my position are considerably lightened by them, and that many of my shortcomings will, when associated with their efforts, be condoned. The obligations accruing to your President are manifold. Not the least of them is that of his obligation to deliver an address, the choice of a subject or subjects for which being more or less of a perplexing nature. One's own business naturally occupies one's thoughts most of all; and so I would bespeak your indulgence while I comment on a few matters of present general importance, and affecting more immediately the Company with which I am connected.

Prior to dealing with these matters, it is my painful duty to refer to the loss sustained by the Association through the deaths of Mr. Robert Bridge, of Doncaster, and Mr. E. W. T. Richmond. The late Mr. Bridge was President of the Association in 1889. For some time past, his presence at our meetings has not been frequent. That was to our loss, as his opinions on matters generally were always welcomed, and especially so on account of his long experience. Unlike Mr. Bridge (who for some time had suffered from a serious illness), Mr. Richmond was cut off without practically a moment's warning. The details of the tragic ending to a life so full of energy and so full of promise must still be vividly impressed on the minds of many of those present, and I need not therefore dwell further upon so painful a subject. I think we should at this moment rather think of his life's work. His career, which may be said to have begun in obscurity, developed into a brilliant success, and is worthy of emulation. At the early age of 38, Mr. Richmond had forced himself into a very honourable position only gained after strenuous exertions. No one will deny that he did much to popularize the use of gas for domestic purposes, and that his energetic methods of conducting his business served to awaken more than one gas undertaking to the fact that there was a day load awaiting them if some enterprise were shown. I may instance the provision and placing of cooking-stoves. The gas industry is the poorer by the loss of these members; and I am sure I am giving voice to the feelings of this assembly in saying we mourn the decease of Mr. Bridge and Mr. Richmond.

Looking at matters of interest to the gas industry generally, there are at the present moment two such outstanding which, together, will tend greatly to increase the popularity of gas for purposes of illumination, will effect an immense saving to consumers, and tend to the additional prosperity of gas undertakings. I refer first to the results of the South Metropolitan Gas Company's application to Parliament for power to reduce the standard illuminating power of gas in their area from 16 to 14 candles; and, secondly, to the wholesale reduction in the price of the mantles for incandescent lighting. These two developments may be justly linked together, because there are not many of us who would care to dispense gas of 14-candle power unless some more economical and efficient means than the ordinary flat-flame burner, as generally retailed, were at the command of our customers.

I have purposely inserted the words "as generally retailed," because in many cases burners are sold which are not at all designed for the quality of gas for which they are used. It is not for a moment suggested that a flat-flame burner cannot be made to suit any quality of gas. On the contrary, it was shown by Mr. G. R. Hislop, of Paisley (to whom, by the way, I am indebted for my entry into the profession, and for most of my knowledge of its technique), in a paper read by him before the North British Association of Gas Managers in 1891, that, in the case of the union jet, the angles at which the gases issue from the orifices are not a fixed quantity for every quality of gas. Briefly, his experiments showed that the lower the quality of the gas the more acute was the angle required by the streams of gas impinging against one another. No one will aver, however, that the economy of the incandescent burner can be touched by the flat-flame burner. Apparently, therefore, the Fates have been kind to the advocates of the lower-grade gas in bringing about a reduction in the price of the, at present, most suitable apparatus for popularizing its use.

The power obtained by the South Metropolitan Gas Company has been in operation for some time, and, judging from the report of the proceedings at the last half-yearly meeting of the proprietors, there appears no reason to regret the change. The Parliamentary Committee stipulated for a reduction in price to the consumer of 1d. per 1000 cubic feet for each candle below 16, but that by such reduction no equivalent increase in dividend should accrue. The price of gas was therefore reduced 2d. per 1000 cubic feet, which meant a saving of some £120,000 in the half year to the Company's customers. Where the *quid pro quo* to the proprietors came in does not appear so plainly; but probably the necessarily gradual reduction from 16 to 14 candles may have militated against the Company reaping in full the advantage of their enterprise.

The reduction in the price of gas one penny per candle decrease in illuminating power seems rather a large amount, if compared with the possible benefit to the proprietor of gas stock. In the case of my own Company, the present price of gas on which the dividend is fixed is 2s. 6d. per 1000 cubic feet. For every penny reduction in price, the proprietors get ¼ per cent. increase in dividend; a decrease of 2d. in the price meaning ½ per cent. more dividend. The consumer, however, receives 2d. reduction for each 2s. 6d., which means 6·6 per cent. Any suggestion of mine would probably not affect the ideas of the legislators of this country; but, as a matter of equity, it seems to me that the benefits likely to accrue should be more equally divided for the following reason: Parliament has come down heavily on companies who, when seeking further powers, were shown to have already spent an amount of capital which was large when compared with the volume of their business. Yet by the South Metropolitan Company's terms, if applied to my Company, they would seek to reduce our revenue 6·6 per cent., as against the benefit of (say) at the most 400 cubic feet of gas more per ton of coal carbonized. On the basis of 9500 cubic feet of gas sold per ton of coal carbonized, this means that the consumers get 1s. 7d., and the Company, roughly, 1s.—a dead loss of 7d. per ton to the Company.

These figures are, of necessity, based on the same coal at the same price being used in the production of both qualities of gas. It may be said that there is a greater range of coals from which the supplies can be drawn. This will readily be admitted; but it does not necessarily follow that more advantageous prices per candle power can be got than previously. To increase the varieties of coal, one must increase the area from which supplies are drawn; and in the case of the North of England, it would never pay gas undertakings to go to Yorkshire, Lancashire, or Scotland for requirements. This, however, does not apply to such an extent to the London Companies, as, from their geographical position, it practically costs the same for them to draw their supplies from any of the well-known coalfields. As to benefiting from an inferior quality of coal, the differences in price would be nullified by the decrease in gas obtained from them, as, commercially, prices would find a level with the qualities. It might further be argued that the gas companies would benefit by increased business. This I readily admit; but, unfortunately, more business means more capital. Further, the adoption of incandescent burners means a decrease in consumption per consumer.

From the consumer's point of view, it may be questioned whether the lower-grade gas at the reduced price is really a benefit to the extent of the reduction; and to many it may seem too early in the day to expect a satisfactory answer. Sir George Livesey is reported to have said, at a meeting of the South Metropolitan Gas Company, that he thought "the consumers had been just as well supplied, and just as well satisfied, with the 14-candle as with the 16-candle gas." Sir George, as the party practically responsible for the change, might be pardoned if he allowed his enthusiasm slightly to brighten up the picture. His quoted words might appear to be rather an exaggeration; but the increase of 4½ per cent. in the gas sold for the half year does not, in an expanding district such as his Company supplies, mean more than a normal increase due to new business. Have the opponents of the Company found it to be so?

It now appears that the London County Council desire to

saddle the Gaslight and Coke Company with similar conditions as to illuminating power, &c. It will be fresh to many of those present how hard that same London County Council fought, before the Committees of the Houses of Parliament, to keep the South Metropolitan Company from getting their powers. Has the County Council subsequently seen the evil of its ways, and found its past attitude wrong? It is only fair to think so, and to give the councillors credit for admitting they were wrong, though at the same time it will be very interesting to learn, if they appear in opposition to the Gaslight and Coke Company before a Parliamentary Committee, the reasons for the change about.

It may not be generally known that more than one local gas company has had for years authority to supply 14-candle power gas. I do not know whether advantage has or has not been taken of those powers. It seems to me that most likely it would not. First, because coal can be obtained locally which will yield from 15⅓ to 16 candle gas; secondly, because the general use of the incandescent system of gas lighting is only of recent date. It seems to me, however, that there is no reason why, if 14-candle power gas is good enough for London, it should not be good enough for Tyneside.

Many of you, no doubt, have been awaiting the results of the further investigation of Professor Vivian B. Lewes and Mr. Shoubridge into the question of feeding blue water gas into the coal-gas retorts when the coal is being carbonized. The Professor showed there was a saving to be gained by his system; and it would be interesting to know how much greater the economy, if any, would prove to be with 14-candle than 16-candle gas as the result of mixing the coal and water gas. It is to be hoped these gentlemen will not allow the question to drop, but will be able, at an early date, at least to satisfy themselves as to whether their process is likely to be a commercial success or not.

The results of the reorganization of the Welsbach Company will help gas undertakings very materially to push the lighting part of their business. Judging from the circulars issued by the Company, they mean business; and it is to be hoped they will be able to carry out all their expressed intentions as regards the development and extension of their trade. It is true they had practically to be forced to see the evil of, and the necessity of mending, their ways. A more substantial mantle would at once throw credit on the new management, and place gas consumers under almost as great an obligation to them as the gas world was to Dr. Auer von Welsbach. For the present mercies, however, it will scarcely be denied that gas undertakings are indebted to the management of the South Metropolitan Gas Company and those companies and corporations who joined in and supported Sir George Livesey's movement.

There is yet another development in gas illumination which goes hand in hand with lower-grade gas and cheap mantles—that is, the high-pressure system, which has been so effectively adopted in several large cities. This, together with the self-intensifying system, is now an assured success for street lighting, and is a worthy rival of the electric arc lamp for almost any purpose, both as regards cost and illuminating effect. Our worthy Vice-President proved this very clearly last year in a practical manner at the Gas Exhibition at Darlington; and I am sure he would do the Association a good turn by giving the members the benefit of his experience on this subject at our next meeting.

Lower-grade gas, however, will come to the aid of gas undertakings as a means of enabling them to enter more keenly into supplying their product for power, industrial, and domestic purposes. The present tendency as regards power is not altogether in favour of electricity. Both electrical and gas companies have to face "power gas." It may be interesting to note how much a large consumer for power purposes would benefit in this district should at any time my Company's standard be reduced. On the same basis as the South Metropolitan Company, a reduction of 2d. would mean nearly 10 per cent., and bring the cost of gas to 1s. 8d. per 1000 cubic feet. The percentage of difference in the calorific values of 16 and 14 candle power gas is simply a fraction of this; and the saving to the consumer is therefore very considerable. For cooking and heating purposes, the benefit is all to the consumer.

There has always been a considerable difference of opinion as to the advisability of having a graduated system of discounts to consumers. The discounts given by the Company I have the honour to serve vary from 5 per cent. to 25 per cent. according to the following scale:—

	Gas for Lighting.		Gas for Power.
1 million and under	5 per cent.	..	10 per cent.
1 ,, to 5 millions	10 ,,	..	15 ,,
5 millions to 10 millions	15 ,,	..	20 ,,
10 ,, and upwards	20 ,,	..	25 ,,

Can such discounts be justified? I think so. The results of the past year's working show that the average price received by the Company was 2s. 2·64d. per 1000 cubic feet; the maximum being 2s. 4⅓d. and the minimum 1s. 10⅓d. per 1000 cubic feet. The proportion of power and works lighting consumers to the total was 56 per cent. during the year ending December 31, 1900. This consumption may be divided into engines and industrial requirements during the day, and lighting and engines during the night; the engines in some cases representing an equal consumption during the 24 hours. A total maximum consumption of 1,032,000 cubic feet per 24 hours was dealt with by gasholders equivalent to 450,000 cubic feet. No lighting load could have been economically dealt with under such conditions as to storage. The mains in use in this district could never, under economical pressures, have delivered the quantity of gas; or if the pressures necessary to supply consumers had been carried, the unaccounted-for gas must have increased.

The success of a community such as in the Mid-Tyne district depends upon the prosperity of the industries in its midst. As we well know, in our branch everything is cut to the lowest. It is the same in all industries; and, after all, it is for the general benefit that industries flourish. Do away with your staple industries, and in nearly all cases you ruin your community. For this reason alone large power consumers should have preferential rates; and in granting these with discretion, one reduces the cost in such a way that the average consumer gets a benefit he otherwise would not receive.

I have dealt with the foregoing subjects because, in my opinion, they especially affect the district supplied by my Company. The domestic consumption is one of recent growth; and therefore the prejudices in favour of the old flat-flame burner have not gained a decided hold upon the consumers. Only a very small minority of consumers stick to the old burner, though even these are gradually being converted to the advantages of incandescent lighting. The Company have opened a show-room for cooking and heating appliances, and are making a speciality of fittings. The lighting of the show-rooms is done on the high-pressure system. It is not customary to wait on a possible consumer turning up. New districts have mains laid in them at the earliest possible moment, and a supply of gas is awaiting anyone who wants it. So soon as the house is tenanted, or if the name of the prospective tenant can be got, the fitting inspector waits on him; and generally a consumer who previous to being called upon had made up his mind to have an oil-lamp is secured. In this way, one is able to push and get adopted the incandescent system, as a burner complete and ready fixed for lighting can, if desired, be supplied at the price of 1s. 6d.

Again, the consumption due to engine and industrial appliances is considerable; and this must be maintained. Large consumers are looking carefully into power-gas installations of their own; and the necessity for keeping a low price is very evident. For both of those reasons, it appears to me that lower-grade gas is quite suitable for this district. Lower-grade gas means lower cost to the consumer. Cheap production brings increased prosperity to the district, and means are furnished to the gas company to conserve and protect the capital employed in their undertaking. The balance being equally in favour of supplier and consumer, surely it seems the result must be satisfactory all round. This district is essentially one of large power and small domestic consumers; and I leave you to judge how far attention to the subjects of my remarks is desirable.

At the spring meeting of the Association, I had the pleasure of submitting to you a record of the increase in the business of the Walker and Wallsend Union Gas Company, dealing more particularly from an engineering point of view with the development of the distributing plant. It is not my intention to give any lengthy details, but simply a general description of the extensions of the manufacturing apparatus, and especially with the works at Willington Quay—the works which you are to visit to-day, and which will, I trust, be of some interest to you all.

The output of gas from the Willington Quay works for the year ending December, 1895, was 71¼ million cubic feet. The end of 1901 saw this raised to 150¾ millions—an increase of 129 per cent., being proportionate year by year. In 1895, there were two retort-houses, containing 98 ⌂-shaped retorts 21 in. by 15 in. and 8 feet long, inside measurements. All the charging was done by means of the shovel. With the plant working at very nearly its maximum productive power, it was necessary to take immediate steps to meet any increased demands. A general arrangement showing the extent to which the site could be developed was prepared, care being taken to design the extensions so that the work could be carried out in sections, and in such a way that no unnecessary expenditure of capital or interference with existing working arrangements would result.

As a first instalment, an addition was made to the original portion of the present hand-charged retort-house. This contained 28 retorts. In order to allow of the extension, it was necessary to alter the position of the boilers, the condensers, and the exhauster-house. These were removed to a site then occupied by the foreman's house and meter-house. A new dwelling-house and combined meter and governor house were erected in the adjoining gasholder yard. The condensing power was also increased by an annular condenser capable of dealing with half-a-million cubic feet per day. At the same time, the two gasholders were converted from two to three lifts. The top lifts were allowed to shoot the columns; and thus, at the cost of the two bells, the storage was increased about 50 per cent. A new sulphate plant was also installed.

The retort-house was the next part of the work to be tackled. On account of the tar and liquor well, which formed the tank of one of the original gasholders, and to clear which it will be seen that the gable of the previous extension of the retort-house has had to be placed at an angle, no further extensions could be made at this point. Hence the reason for the position of the stage-floor retort-house. This house contains ten ovens having eight retorts in each. The firing is on the regenerative principle

—five being on Mr. G. R. Hislop's system, and five on Drake's system. The charging and drawing of retorts are done by West's manual machinery. Two years ago, new scrubbers and washers were erected; and the original scheme is now completed with the exception of the steam-boilers, which will ultimately be alongside the present ones, but of the Cornish type. I think you will agree with me, after you have inspected the works, that there is not much space left on which to do more. The site of the works is leasehold; and to those who may be disappointed at the want of architectural elaboration in the buildings, I would say that there did not appear to me to be any use in erecting ornamental buildings for the benefit of the owners of the freehold.

A few years ago, a general tendency to a policy of indifference in the matter of electricity supply was very greatly apparent. During the past two or three years, however, this indifference has somewhat diminished, and electricity *versus* gas is now very much to the fore. Under the circumstances, this is as it should be in its competitive sense; but, however the gas world may look upon the kindred industry in competition, it is now clear that the policy of the past is to be regretted. A few years back, electricity was used principally as an illuminant, and was similar in its application to coal gas. My experience leads me to think it would have been better had the consolidation of the two industries been recognized in the earlier days. In this part of Tyneside, you have the unique fact of a Gas Company having the double powers, the results of which will, in a practical manner, be placed before you in the programme this afternoon, and be of more interest to you than any comments I may now make.

Hitherto no clear data, based on actual results, existed as a true standard of comparison between gas and electricity, and perhaps some of you are expecting something of a concrete nature in this respect. It is not my mission to-day to discourse on gas *versus* electricity. In view, however, of your visit to the power station this afternoon, a few remarks upon the development of our electricity undertaking, and the present position it has attained, will not be amiss. For details, I would refer you to the pamphlet of which, through the kindness of my Chairman and Directors, each of you has received a copy.

The area of my Company's supply is probably the busiest manufacturing part of Tyneside. It is a compact area comprising a large number of shipbuilding, engineering, and kindred works, having had more or less private installations of electricity for both lighting and motive power. The present-day tendency is to make provision for carrying on business in the most economical manner possible; and it was in the matter of economy that the various manufacturers in this district considered the question of a central source of supply, and decided that the Gas Company, who had already successfully met the wants of the district in the matter of gas supply, would possibly be the best party to provide it.

This co-operation culminated in my Company applying to Parliament, and receiving powers by what was the first Act of Parliament of its kind. It was thus the pioneer of the great power schemes now being developed throughout the country. This was the beginning of our electrical undertaking, the extent of which you will realize when I inform you that we supply power to motors equal to over 3000-horse power, and are at the present time sending out over 60,000 units per week, or over 3 million units per year. Of course, the main object of our supply is power; but I may say that nearly all the lighting in the shipyards is electrical. The great Power Supply Companies before mentioned cover extended areas, and are at present on trial. Whether or not they will prove a success, the difficulties arising from their extended area of supply are not applicable to us.

It is now well known that the economical production of electricity depends largely upon the size of the generating station, the amount produced, and the load factor. In order to attain as far as possible—especially the latter—to this condition, my Company entered into an arrangement with the Newcastle-upon-Tyne Electric Supply Company, Limited, whereby a combination for generation purposes was effected, conducing both to economical capital expenditure and working expenses. Costs were thus reduced to a minimum. The Newcastle Company's load being principally a night load, and the Gas Company's essentially a day load, saved, as you will readily conceive, a great expenditure in capital to both Companies, and reduces the cost of production to the lowest possible point.

The cost of the generation of the current sent out from the power house last week was 0·35d. per unit—a figure unapproached by any other undertaking in the United Kingdom, and this with an output of 120,000 units for the week, 68,000 of which were taken by the Gas Company, and 52,000 by the Newcastle Company. Under such circumstances, my Company can sell at a price which should command the market—viz., averaging from 1d. to 1½d. per unit for power purposes. A graduated scale is in vogue; and it is possible, under the most favoured circumstances, upon our present tariff, for the price to consumers to work out at 0·9d. per unit. Yet, notwithstanding so low a price, we show a profit in this our first complete year's working.

I trust you will agree with me that at any rate two points dealt with in my address are worthy of consideration. First, that the reduction in the costs of production of electricity, both as regards capital expenditure and generation, in a station such as you will see to-day, is bound to cheapen the price at which electric energy can be supplied; and, secondly, that lower-grade gas and a general adoption of the incandescent burner form weapons in the hands of gas undertakings which, as a means of reducing cost to the consumer, should at the earliest possible moment be brought into action. The moral is plain. But, in conclusion, I would confidently express the opinion that there is as great a future for coal gas as there has been a past, and that the many processes now in course of evolution will, though perhaps not in our day, reduce prices to a figure which even the most sanguine dare not dream of.

The PRESIDENT added that he had been reminded that Mr. Smith, of Darlington, had also died recently. Mr. Smith had, perhaps, not taken a very great interest in the meetings of the Association lately, but he was quite sure the members would agree with him that they regretted his loss.

Mr. T. BOWER (West Hartlepool) said it was a very pleasing duty that had accrued to him, of proposing a hearty vote of thanks to the President for his able and eloquent address. He thought they would all agree with him that the President had put before them that morning many points which would serve for food for reflection in quieter hours. It was not given to every President of that Association to pass the chair at the age at which their present President occupied it. They had had several very young Presidents; and he was not quite sure but that the present President was about one of the youngest that they had had. However, he did not think that they could cavil with him upon that point, because he had shown them that nothing could beat the old men better than the young ones. It was to the young men of the Association that they must look forward for its prestige being maintained; and so long as they could have members coming forward who would put before them matter such as their President had put before them that day, he did not think they need fear for the future of the North of England Association. It was true that the present occupier of the position had greater facilities than were within the reach of more than a very few. It was not often that they could listen, either in that Association or in any other connected with the gas industry, to a joint presidential address upon the two topics of gas and electricity. He should have liked, for some reasons, to have been able to break their acknowledged rule of not discussing the President's address, because there were one or two points in it upon which he should have liked ten minutes to thresh them out with him. However, he must let that pass. Some other opportunity might, perhaps, present itself. But, at the same time, the President had put before them one or two so very striking points that he should like to take notice at least of the last one—that in which he told them that his Company were to-day producing electric current at 0·35d. per unit. If that were so, and a profit could be made out of it, he thought that the sooner the gas managers looked to their laurels the better it would be for the gas industry. The President had qualified his statement to some extent by another reference he had made in his address, where he told them that he had introduced nothing of an ornate character in the buildings, and that anything he had done had been of the very cheapest character. That might, to some extent, minimize the cost of the current; but, at the same time, if it were possible to produce current at that price, and to sell it at a profit, at least it was rather startling to him; and he thought they must just look round the corner and see what they could do to qualify the matter. It was, however, with the very greatest possible pleasure that he proposed the vote of thanks; and he knew that it would be heartily responded to by the Association. He would like to take the opportunity of congratulating the Chairman and Directors of that Company in having in charge of their undertaking such an able and efficient Manager.

Mr. E. E. J. ANDERSON (Middleton) said that after the very able manner in which Mr. Bower had proposed the vote of thanks, there was very little left for him in seconding it, except to say that he concurred in asking the Vice-President to bring up a paper on intensified lighting for their next meeting. He thought it was one of the things which, at the present time, they should look into; and if it were properly handled, the electric light would have to take the background for years to come.

The VICE-PRESIDENT (Mr. F. P. TARRATT, of Darlington) put the motion to the meeting; and it was adopted.

The PRESIDENT thanked Mr. Bower and Mr. Anderson for their kind remarks. He should duly take note of what Mr. Bower had said, and of the various points he wished elucidated; and he might very possibly bring them up at some future meeting of the Association. As there was not much time to spare, he would say no more. He could assure them that if it had been a source of pleasure to them to listen to him that day, it had been a very great pleasure to him to deliver the address.

Mr. D. E. GARLICK (Barnoldswick) read the following paper:—

THE INCREASED CONSUMPTION OF GAS THAT MAY BE OBTAINED BY THE USE OF COOKING AND HEATING STOVES.

The subject of this paper is important to the gas industry, and also to the owners of all gas undertakings; while the adoption of gas for cooking and heating is important to the consumers. In the first place, it is important because it will cause an increase in the day consumption, and thereby a more equal production of gas during the twenty-four hours, especially in the summer

months; secondly, it causes a corresponding decrease in the amount of smoke emitted to pollute the atmosphere; and, thirdly, it is of great benefit to the consumer, because it is the cheapest, cleanest, and most efficient method of cooking.

It is gratifying to find that during the past few years the use of gas for cooking purposes has been largely developed, and the number of cookers considerably increased. Previous to the year 1898, there are no reliable figures available as to the number of cookers in use; but the following will show the rapid increase that has taken place during the past three years. In 1898, the number of undertakings in England and Wales that sent returns to the "Gas World Directory," and included the number of cookers they each had in use, was 688. These 688 undertakings represented 2,157,293 consumers and 509,259 cookers, which is an average of one cooker to every four consumers.

This appears to be a very favourable proportion of cookers to the number of consumers; but so well has the use of gas for cooking purposes been established in London by the Gas Companies, that we find, on deducting them from the total, there is a vast alteration in the proportion. In 1898, the London Companies represented 585,542 consumers and 271,392 cookers—an average of about one cooker to two consumers. Deducting these figures from the total, we have remaining in the provinces 1,571,751 consumers and 237,867 cookers—an average of about one cooker to 6·6 consumers.

The following figures for 1901 show the increase that has taken place since 1898:—

Number of undertakings in England and Wales which have included the number of cookers in their returns.	966
Representing consumers	3,096,597
,, cookers	928,037
Average proportion of cookers to consumers (about)	1 in 3

London Companies.

London Companies, consumers	713,493
,, ,, cookers	375,658
Average proportion (about)	1 in 2

London Companies Deducted.

Number of consumers in the provinces	2,383,104
,, cookers ,, ,,	552,379
Average proportion of cookers to consumers (about)	1 in 4

We find, therefore, that the number of cookers during the last three years has been nearly doubled; and the prospects are that the time is not far distant when every householder who consumes gas will have a gas-cooker. But how is this to be accomplished? By engineers and managers doing all they can to promote the use of gas for this purpose, and by owners of gas undertakings giving their managers all the facilities they can in this direction, by supplying gas at as cheap a figure as possible. While referring to this, let me point out that corporations who relieve the rates at the expense of the gas department restrict, to a certain extent, the sale of gas, as the price is enhanced thereby; whereas if the amount of money used to reduce the rates were employed for lowering the price at which gas was sold, an increased business would result, and a greater benefit accrue to the consumers and townspeople.

I believe it is the custom of many companies and corporations to regularly advertise that they are prepared to supply cookers on hire and fix them (generally free of cost); and no doubt this is a very good way of bringing the matter to the notice of the public, and has good results. The various methods in vogue among gas companies and local authorities for the purpose of extending and popularizing the use of cooking and heating stoves with the public, and which are to be recommended, may be classed as follows: (1) Exhibitions and cookery lectures. (2) Systematic advertising. (3) A good show-room. (4) Canvassing. The latter is an introduction of recent years; and, from the reports in the "JOURNAL OF GAS LIGHTING" and the "Gas World," encouraging results have been achieved. I would venture to add a fifth recommendation, and that is "prompt attention to all orders and complaints"—a matter of very great importance, for if we neglect it we may be apt to be classed under the heading "The Society for the Prevention of the Sale of Gas."

So far as the writer's experience goes, he cannot claim to have received the advantages of all the four methods enumerated above, except a few exhibitions and a show-room; and for a small place with a population of 6000, where the sole industry is the manufacture of cotton goods, a good number of cookers have been fixed, and a fair increase obtained in the consumption of gas, which is shown by the following table:—

Year Ended.	Total Gas Sold.	Gas Sold for Lighting.	Gas Sold for Cooking, &c.	No. of Consumers.	No. of Cookers.
Mar. 31, 1895	8,657,200	7,567,400	1,089,800	320	85
Mar. 31, 1901	20,834,900	15,785,500	5,049,900	1049	450
Mar. 31, 1902	24,092,100	17,269,000	6,823,100	1250	600

It will be seen from the above that the sale of gas for cooking, &c., in 1895 was one-eighth of the total; and this has increased until in 1902 it is more than one-fourth. In summer, the day and night consumptions are equal.

The reason why we have had a good increase in the number of cookers fixed is, I think, due to the fact that in almost every case where an application has been made to us a cooker has been supplied and fixed free. In streets consisting of houses which are old property, it is seldom that there are interior fittings for gas. If there has been an application from a tenant in a street of this description for a stove, we have promptly laid on a main for the whole ten or twenty houses as the case may be; and in a short time we have often had applications for six or ten more cookers to be put in, and sometimes the landlord or tenant has had interior fittings fixed, when once gas has been laid on to the houses. This is, I think, one method by which the use of gas for cooking purposes can be successfully extended; for whereas in new property one may be pretty sure of consumers, in old property one is not so sure unless he takes the risk of introducing a supply of gas on easy terms. Another important method is to bring gas-cookers into use among the poorer classes by means of the slot-meter.

To return to the London Gas Companies, who have been so successful in the sale of gas for cooking purposes, we find that not many places have the same proportion of stoves to the number of consumers, except a few seaside towns and inland watering-places, and perhaps two or three industrial towns in England and Wales. The town of Peebles (Scotland) has, I believe, the highest proportion of cookers to consumers—viz., 800 cookers and 1100 consumers. It is, therefore, our business to see if the same success cannot be attained elsewhere. In the meantime, it is the duty of those who have the control of gas undertakings to do all that lies in their power to extend the use of gas for all domestic purposes as much as possible, and to make it so greatly appreciated and valued that it will become a necessity that cannot be dispensed with.

The writer looks forward to the time when this result shall have been achieved; so that architects and builders will, when preparing plans and specifications for houses, include provision for the fixing of gas-cookers in all ranges, and for copper boilers to be supplied instead of the ordinary set pans. In place of the latter (which are troublesome and costly), gas-boilers are now often supplied, being much cheaper and more economical; and the set boiler will no doubt in the future become a thing of the past. In some of the Lancashire towns, it has already been displaced to a considerable extent. When we consider that for every cooker, gas-fire, or boiler fixed there is a corresponding decrease of smoke emitted into the atmosphere, we see that all apparatus used for this purpose offers a still further advantage, and this apart from the value of the cooker or stove for the particular purpose it is made for. Not only does this apparatus benefit the person who uses it, but, by the reduction of the smoke nuisance, the whole community is benefited.

Important as the use of gas is for cooking purposes, there is another way in which it promises to play a more important part in the future, and that is for motive power. Mr. Foulis, in his Presidential Address to the Institution of Shipbuilders in Scotland, stated that in 1899 it was estimated there were 50,000 gas-engines at work, and that from 6000 to 7000 were being made per annum in this country alone. Whereas twenty years ago 30 cubic feet of town gas were consumed per brake horse power per hour with a thermal efficiency of 12 per cent., improvements had taken place to such an extent that the consumption of gas was now only 15 cubic feet of town gas per brake horse power per hour, with a thermal efficiency of 25 per cent., and that recent improvements had even reduced the consumption to 13 feet and 29 per cent. heat efficiency. We see, therefore, on the authority of one of the most eminent engineers, that there is likely to be a great future for the gas-engine.

There are further improvements yet to take place in the gas-engine; and what is required from gas makers and suppliers is that gas must be made and sold cheaply in order to compete with other forms of motive power. From the success which has been attained during the past few years in the development of the use of gas for cooking, heating, and motive power, we may take it that in a few years more the sale of gas for this purpose will no doubt be double what it is at the present day, if proper means are employed by those who have it in their hands to hasten or delay this possible increase in the sale of gas. The use of gas has a firm hold on the public to-day; and this has been strengthened by means of the incandescent burner, which as an illuminant has beaten all its rivals, both for economy and efficiency. We may strengthen that hold still further by the development of the use of gas for cooking, heating, and motive power.

Discussion.

Mr. F. P. TARRATT (Darlington) said he must thank Mr. Garlick for his very able contribution. He was sure they were all very much indebted to Mr. Garlick for the points he had put before them. One could not help being struck by the extraordinary strides that had been made in his town during the past seven years. They would have thought it almost impossible, in any town, to increase the number of consumers from 320 to 1250 in that short time. He could not help thinking that the majority of his additional cookers must have been fitted in conjunction with slot meters. This was judging from his own experience, because, notwithstanding the fact that he had endeavoured to push the hire of cookers, even after strenuous efforts made for three winters, their orders for ordinary hires would only amount to 130 or 150; whereas they took orders for upwards of 1500 slot cookers. So he could not help thinking that a large number of Mr. Garlick's must have been slot cookers; but he would be able to make that clear. With regard to the point he raised about the

accommodation which should be provided for gas-cookers, this was a point which should not be overlooked, so that in new properties provision should be made for cookers. Everyone would benefit thereby, because when one attempted to fix cookers in cottages, householders, when provision was not made, preferred to do without them. There was the feeling that if provision were made for cookers in new properties, there would not be this difficulty. Mr. Garlick mentioned gas-engine consumption, in which there was a large field. He quite agreed with him in this respect; and he thought that the remarks which appeared in one of the leading articles in the "JOURNAL OF GAS LIGHTING" for September 2* were very much to the point. The article said: "The encouragement of the use of gas-engines is one of the marks of enlightened gas policy; but in very few places (and nowhere as yet in the United Kingdom) has the ultimate possibility of this policy of encouragement been sounded." Mr. Garlick did not make any mention of what gas-engines they had at Barnoldswick; but he certainly thought that there was a large field for increasing their daily output of gas for engines. In his own town, during the past three years, the output of gas for motive power had doubled.

Mr. W. HARDIE (Tynemouth) thought the subject which had been brought before them that morning was one of very great importance. It was one, perhaps, that there would not be much adverse criticism upon, because he supposed they would all be wanting in some way to increase the number of gas heating and cooking appliances in use. But there were one or two little things in the paper he might mention. Mr. Garlick gave them a table showing the quantity of gas sold for lighting and the quantity sold for cooking. So far as he himself was concerned, he could not give those figures, because, of course, they did not use special meters for the purpose. He would like to know whether Mr. Garlick's figures were taken from special meters or were calculations. He thought it was desirable that gas managers should, as far as they could, press business in gas-engines, and also keep themselves well in hand in the matter. So far as he was concerned, he had six gas-engines in the works, for various purposes; and the men who were engaged at them got such instruction in the use of gas-engines that they were able, on complaints being made in the town, to give advice which it was very desirable they should be able to give—such as would tend to ensure a continuance of the use of the gas-engine. What the writer of the paper stated in regard to the increase of gas-cookers, seemed to be a sort of universal experience. In his own case, he had at one time an average of one cooker to three-and-a-half consumers; whereas at the present time, he thought, the average worked out at about one to two-and-three-quarter consumers. This, as Mr. Tarratt remarked, was due to the number of cookers put in with slot meters. At the present time, his average for ordinary consumers was about one cooker to four-and-a-half customers; and of slot cookers, about one to rather under two consumers. The prepayment system of using gas was practically of no use unless consumers were going either to have a gas-cooker or to employ gas for other than lighting purposes.

Mr. H. TOBEY (Malton) proposed a vote of thanks to Mr. Garlick for his paper. He thought it was some fifteen or sixteen years ago since he began to hire gas-cookers at the rate of one penny per month. Only about one cooker to every four consumers was ordered. He did not know that they had advanced much further than that since. He had had to depart from the penny per month system, because he found that after a time, if an exhibition were held everybody wanted fresh cookers. Nearly every slot consumer would take a cooker of some kind or other, or if he did not take a cooker he would have a griller; and he found that the majority of gas consumers were willing to use gas for other purposes than lighting. Mr. Garlick did not mention whether he charged differential prices for gas. He seemed to have very definite notes of the quantities consumed for the various purposes; but he did not say whether these were estimates or not, or whether differential prices were charged. The gas-engine had many advantages in the way of the growth of consumption; and he quite agreed that it was a branch which should be encouraged. He had been in the habit of giving differential rates for motive-power gas—as much as 33⅓ per cent. in the case of gas-engines where there was a large consumption. Where there was a small consumption, he allowed a smaller rebate. At one time, he gave a rebate for all sizes; but he found that in some cases the consumption was so small that they had very little advantage. Unless they had engines which consumed from 50,000 to 100,000 cubic feet per annum, it was really of no great advantage to give a rebate.

Mr. C. DRU DRURY (Sunderland) had much pleasure in seconding the proposal. It was a distinct effort to most of them to prepare a paper to be read at the meetings of the Association. Not only were available subjects thrashed bare in various communications, but there was very little time for the members to devote to the writing of papers.

The PRESIDENT having put the motion to the meeting, and it having been adopted,

Mr. GARLICK said this was his first appearance before the North of England Association, and he thanked them very much for the attention and the vote they had given to him. He would reply to the few questions which had been put as briefly as possible, because their time was so limited. Mr. Tarratt said he had no doubt that many of the cookers he had fixed were with slot meters, and he might say that they had 250 slot meters out of the 600. Mr. Tarratt also referred to the consumption of gas in engines. He could not give the figures for this just then; but it was not very much, because the sole industry in the district was the manufacture of cotton goods, and, of course, the power was obtained by steam-engines. Gas-engines did not form a large proportion of the consumption given in that table. Mr. Hardie asked whether the figures were estimates of the consumption for cooking and lighting. He might say that they were accurate. They had two meters and two prices; and the figures in the table were taken from the registers. Their prices used to be 3s. 3d. per 1000 cubic feet for lighting and 2s. 9d. for cooking; but they resolved to make them one, and to have no differential rates. They found that where they had a slot meter for lighting and another for cooking, it was very expensive. If they had to use both a slot meter and an ordinary meter, it increased their capital account, and, besides, it confused their fittings. They had also more complication in their books. So they were charging 2s. 11d. per 1000 cubic feet, and it had not decreased their consumption. They intended to bring the price down to 2s. 9d. as soon as they could. But they had had no complaint since they raised the lower price, because consumers having one meter only, had one less to pay for. So they were quite satisfied with gas at 2s. 11d. for all purposes. He thanked them for the way in which they had received his paper.

The PRESIDENT said that that finished the business of the meeting.

The members were conveyed by electric cars to the Neptune Bank Electric Power station, which belongs jointly to the Newcastle-upon-Tyne Electric Supply Company, Limited, and the Walker and Wallsend Union Gas Company. The Gas Company had thoughtfully provided each member with a handsome booklet descriptive of the works, and with its aid, and that of a staff of willing guides, the working of the palpitating plant was easily followed. The sight was an interesting one to those who are accustomed to the still processes of gas production. Resuming their seats in the cars, the visitors were conveyed to the works of the Gas Company at Willington Quay—a journey of fifteen minutes' duration. There they found, as the President had said, works of an exceedingly plain character, but quite in keeping with their surroundings. The site is a confined one, and is not improved by a public street which passes through it. But the most has been made of the available accommodation. The works have been to a large extent reconstructed since Mr. Walker took charge of them in 1895. He has built a new retort-house, upon the single-stage design, with a bench of single settings, ten in number, each containing eight retorts 8 ft. long by 22 in. by 16 in. ⊏ shaped. The coal is broken and elevated to an overhead hopper by machinery driven by a gas-engine of 20-horse power, which is situated underground. The stoking is by West's manual machines, and the few men who were working the plant were making a tidy job. The coke falls into barrows on the lower floor, and is wheeled into the yard, on the same level, where it is quenched by hand labour. It is sold locally; being removed by the purchasers, so that there is never any accumulation. There are two types of condensers—an atmospheric series, which is old, and an annular series, which is new. There are two Livesey washers, which can be worked either together or singly. Each is capable of dealing with half-a-million cubic feet per day. There are two tower scrubbers, which are new. They are of 10 feet diameter, and 40 feet in height, with provision for their being heightened to 60 or 70 feet. With so large a washing and scrubbing plant, it is found possible to get along with a purifying plant which appears to an outsider to be small for the works. There are four boxes, each 14 ft. 6 in. square. The output of the works last year was 160 million cubic feet. The purifiers are old ones. On the other side of the street are the governor and meter house and the gasholder. The governors—three in number, Peebles patent, connected to 12-inch pipes—and the station meter (equal to passing a million cubic feet per twenty-four hours, by R. Laidlaw and Son) are in the same house, which is new. There are two holders, each of three lifts, the upper of which was added since Mr. Walker came to the works, and are arranged to rise clear of the guide-columns. The whole works, though somewhat crowded, seem to be most convenient for working; and the order in which everything was found by the members reflected the greatest credit upon Mr. Walker and his staff.

The visitors, after the inspection, took train at Willington Quay for the Central Station, Newcastle; and in the County Hotel in Newcastle they sat down, on the invitation of the Walker and Wallsend Gas Company, to a most excellent dinner, for which everyone was by that time—four o'clock in the afternoon—quite ready. Colonel Crawford occupied the chair, and proposed the toast of "The North of England Gas Managers' Association," which was acknowledged by the President. "The Chairman and Directors of the Walker and Wallsend Union Gas Company," was proposed by Mr. W. Doig Gibb, of Newcastle, and was acknowledged by the Chairman. Mr. W. Hardie, of Tynemouth, proposed "Kindred Associations;" and Mr. Tim Duxbury, of Oldham, responded.

* Page 609.

MANUFACTURE OF SULPHATE OF AMMONIA.

By R. T. Stoddard, of Manchester.

[A Paper read before the Manchester and District Junior Gas Association, Sept. 27.]

As you are perhaps aware, the subject of to-night's paper covers a large field of work; and it would be impossible for me to deal with all the various items in detail in a satisfactory manner in the short space of time at my disposal. It is, therefore, my intention to deal with the subject in a general way, not confining myself to any one piece of apparatus nor to any one make of plant, but to try and describe to you the apparatus required and also the method of working. This appears to me to be the most satisfactory way of dealing with it to-night, and then at some future time to go more into detail as to working, and also the possible troubles that may arise, with notes on how to avoid them, and, when they do occur, how to remedy them. With this idea in view, I hope you will make due allowance for any omissions which must necessarily occur.

The systems in vogue are: (I.) Intermittent; (II.) Continuous. The former, being almost obsolete, I will only briefly describe, and pass on to the more important, and now almost universal, system—the continuous.

Intermittent System.

Firstly, the intermittent system consists of running a quantity of ammoniacal liquor, along with milk of lime, into a closed vessel—very often a cylindrical vessel with dome-shaped top and bottom. After making all joints tight and secure, it is then heated, either by steam or fire alone, or a combination of the two, in which case the steam acts as an agitator in the liquid, and so prevents the lime from settling to the bottom, which, if it actually took place, would have a detrimental effect on the vessel and the results obtained. The ammonia gas as it is given off passes into sulphuric acid, contained in a leaden vessel known as the saturator; and from this crystals of ammonium sulphate are drawn out with a scoop. The strong ammonia gas at the early portion works up or concentrates the weak "mother" liquor made at the end of the previous working.

Continuous System.

Generally, the apparatus used is the same in all kinds of makes, the only difference being the shape of the hoods in the rings used for splitting up the gas into small streams, and the position of the several portions in relation to one another—for example, the "free" and "fixed" ammonia being built on separate bases—combined with structural modifications, and perhaps one or two minor details claimed by the makers as being advantageous both as regards economy and facilitating manipulation and cleaning out. It is necessary that provision be made for ensuring a constant supply of ammonia liquor to the stills, either by elevated tanks or tanks on the ground level with pumps in duplicate; the former at sufficient height to allow of liquor flowing into the stills by gravitation. In any case, it is advisable to have a tank of a capacity equal to (say) twelve hours consumption. This allows of the thorough separation of light, tarry matter; for, according to the nature of things, ammoniacal liquor such as results from mixing up the aqueous liquors from the hydraulic main, condensers, and scrubbers, is always more or less charged with tarry substances. Some of these are dissolved in the water, while others are mechanically held suspended, and can be separated by proper settling.

It is very important that this should be done, as it creates a nuisance, both as regards smell and effect on the making up of the stills. Therefore, provision should be made in this tank for the running off of the tar which may have separated. This tank also affords a ready means of measuring the liquor used from time to time. In the case of pumps being used, they should be fully capable of dealing with the quantity required, and also have a fair margin in excess; so that, should any inefficient working of same take place, it would not materially interfere with the satisfactory working of the apparatus until opportunity had arisen for such defect being removed. A relief valve should be placed between the pumps and the stills, to allow of any surplus liquor not passing through the valves being returned by means of a bye-pass to the tank; this relief valve being worked in conjunction with a pressure-gauge. By this means the supply of liquor to the stills is always of the same pressure. The following apparatus is required for this system: First, a heater (generally tubular) through which the waste gases from the saturator pass and heat the liquor, which flows along the tubes in an opposite direction to the gas. By this means, the ammoniacal liquor is brought to a high temperature before entering the still.

Lime-Mixer.

This consists of a rectangular tank fitted with a division-plate having small perforations to prevent unslacked lime and solid matter from passing through into the liquid. From it this is then run into a storage tank fitted with an agitator, from which the stills are fed.

Stills.

These have been given perhaps the most attention of any portion of the plant, with the result that we have now a large number of patents, among the most generally known are the following:—

Walker.—This consists of a cast-iron column divided into three sections, the upper portion of which has a number of trays or dishes covered with cast-iron hoods with serrated lower edges, also fitted with overflow pipes, so arranged as to form a seal to each tray. In this portion, the "free" ammonia gas is driven off (I will explain this term later on). The centre portion is the "liming" chamber; the liquid being mixed with milk of lime and heated and agitated by a jet of steam. The purpose of this is to liberate the "fixed" ammonia gas. The lower portion has also a number of trays, similar to the "free" portion, fitted with hoods and overflow pipes, at the bottom of which a jet of steam is placed. As the steam and hot gases ascend, they heat the liquor, which flows from tray to tray and gives off ammonia gas. At the bottom of the still is placed a suitable arrangement for keeping a seal on the spent liquor outlet. All the rings are held in position by holding-down bolts; arrangements being made for each hood being lifted up to facilitate cleaning out, without taking the still down. This is a great advantage.

Wilton.—In this still, the hoods are different, taking the form of circular dome-shape with serrated lower edges; also the whole of the rings being bolted to each other. The liming chamber is built on a separate base; the liquor being run off from the bottom of the free section, through the liming chamber, and then forced into the fixed portion by a fresh quantity of liquor from the free portion. Attached to this still is a novel automatic arrangement for measuring the lime and blowing it into the liming chamber. This consists of a cast-iron cylindrical vessel about 3 feet diameter, with flanges on the top and bottom. On the bottom, two outlets are arranged—one in the centre for flushing purposes, while the other is the delivery to the stills. Inside a wrought-iron float is arranged, to the top of which is a rod working in a stuffing box on the lid of the cylinder. The rod actuates a quadrant by means of a chain, the quadrant being weighted and arranged so as to open the steam-valve and close the lime-valve, or *vice versâ*.

Its action is as follows: The lime is run in through a wrought-iron pipe at the top, and rises up in the cylinder, at the same time lifting the float, which, working the rod, pushes the weight of the quadrant upwards until it just overbalances, when it shuts off the lime and opens the steam-valve. The steam, passing down in the wrought-iron pipe in the top of the cylinder, forces the lime out at the bottom into the still. When all the lime has been emptied out, the float settles to the bottom, pulling the quadrant back again by means of a chain, which shuts off the steam and opens the lime-valve. This continues automatically, the quantity being regulated by means of a valve on the inlet lime-pipe. The spent liquor outlet is governed by a float actuating a conical valve; the idea being to avoid all risk of steam escaping from the still. This still has, however, just been improved upon; the improvements being that, instead of the hood being circular dome-shaped, it takes the form of three inverted troughs (rectangular) having serrated edges. These reach across the ring; and opposite each end are manholes large enough to allow of this being removed for cleaning purposes—the liquor being compelled to pass through these serrations on its way from the inlet-pipe to the outlet-pipe, which is at the opposite end of the ring. Manholes are also opposite the inlet and outlet pipes, for the same purpose.

Colson.—This is different from the previous two, inasmuch as the "free" and "fixed" portions are built separate, and connected to each other by wrought-iron pipes. Each portion contains, instead of one large hood, a number of smaller ones, the number depending upon the size of the still. The joints are faced, and have a recess formed to receive $\frac{3}{8}$-inch square india rubber; the trays being held in position by holding-down bolts similar to Walker's. Steam is admitted at the bottom of the free ammonia portion, having arms radiating from the centre towards the circumference, the ends of which are so arranged that the steam flows across the bottom of the overflow-pipes.

Dempster.—This is somewhat similar to the Colson still, inasmuch as the "free" and "fixed" portions are separate. The connections are the same; the difference being that the still itself is square, and the openings rectangular covered with inverted troughs or hoods having serrated edges. Each section is bolted together; therefore holding-down bolts not being required.

General Remarks.—(1) Instead of the ordinary steam inlet at the still bottom, a pipe should be so arranged as to keep the liquor constantly agitated; this pipe being below the liquor level, whereas in nearly all cases this is above the level. (2) All stills should be fitted with pressure-gauges and safety-valves. (3) A catch-box for collecting and returning into the still any liquor which may be carried over with the gas, otherwise coloured sulphate will be the result. (4) Thermometers should be placed on the liquor inlet-pipe to the still.

Saturators.

Formerly these were all of the open type, which consisted generally of a wooden box lined with sheet lead, one-half of which is entirely covered, and a lead apron hanging down into the sulphuric acid to prevent the escape of gases. All the joints should be heavily burned. The salt, as it is formed, is "fished" out by means of a perforated scoop. This has been greatly improved

upon by the patents of Wilton and Colson; the former consisting of a round dome-shaped closed vessel, at the bottom of which a well is made, where the salt deposits, and is then ejected through a pipe to the drying apparatus. By this apparatus, the inhaling by the operator of the noxious gases produced is reduced to a minimum. On the top of the saturator, one or two catch boxes are fixed, for collecting any particles of acid which may be carried off by the gases. On the top of these boxes are arranged the waste-gas pipes. The majority of these saturators are fitted with the double ammonia gas-pipes, for reasons which will be afterwards mentioned.

Colson.—This is a round vessel having a conical bottom into which the salt falls after formation, and is removed by means of a gun-metal valve, which is opened periodically; thus emptying the sulphate of ammonia on to the drying apparatus.

Taylor.—An improvement on the lead-lined box saturator is the solid lead one. Messrs. Taylor, of Bolton, make a speciality of them. The life of these is considerably longer than those formerly made—depending, of course, upon the thickness of lead.

General Remarks.—It is advisable to have a double ammonia pipe in the saturator, containing perforations, by which a better diffusion of the gases is obtained. These pipes are, of course, kept well below the surface of the acid. They are also reduced in area, making them much stronger than when only one is employed. Another advantage is to have these ammonia pipes detachable; manholes being fixed for cleaning out purposes.

Drying the Salt.

The drying of the salt is done very largely by allowing it to drain on boards which are at a slight incline. These are placed on a lead dish or trough to collect the mother liquor. This is used over again in the saturator for diluting the sulphuric acid. In some cases, centrifugal machines are used for this purpose, preferably over driven, as it allows of the salt being discharged through the bottom. The cage is constructed of copper, while the outer casing is made of thick lead (cast); the mother liquor extracted returning to the saturator. By this means the salt may be got sufficiently dry to allow of being packed within twenty-four hours of its manufacture. In cases where a large quantity of sulphate of ammonia is made and stored for a short time, it is an advantage to have elevators and conveyors; thus minimizing the amount of labour for the handling of the salt, which also has the advantage of keeping it clean and free from foreign matter.

Water-Cooled Condensers.

These are employed for cooling the waste gases, and may be similar to ordinary coal-gas condensers, depending on the quantity of sulphate of ammonia made as to the kind used. At the bottom of these are pipes for running off the liquor as it is formed, to which should be fitted seal-pots. By this means, the proper working conditions are maintained. In the working of sulphate of ammonia plant, the composition of the ammoniacal liquor bears an important part. The ammonia is present in two forms —viz., "free" and "fixed." The term "free" is as follows:—

$$(NH_4)_2\,CO_3 = 2\,NH_3 + CO_2 + H_2O$$
$$(NH_4)_2\,S \quad = 2\,NH_3 + H_2S.$$

Much of the ammonia in gas liquor is present in the form of salts, which volatilize on boiling, although with dissociation this volatile ammonia can be expelled by simple prolonged boiling of the liquor. The "fixed" ammonia that is present as ammonium sulphate, ammonium chloride, and ammonium sulphocyanide requires lime for decomposition, thus—

$$NH_4\,Cl + Ca\,(OH)_2 \quad = \quad NH_3 + Ca\,Cl_2 + H_2O.$$

The composition of the liquor will depend to a very large extent upon the impurities in the coal carbonized: (1) Temperature of retorts; (2) temperature to which the gas liquor has been exposed; and (3) by the exposure to air, which oxidizes sulphides to theosulphates. The ratio of the "fixed" compared with the "free" ammonia decreases with the process of condensation—that is, it is the highest in the hydraulic main and lowest at the finish of the washing apparatus.

In the hydraulic main, the fixed ammonia present is 59 per per cent. of the total; while in the condensers it is 5 per cent. and in the washers 4 per cent. of total ammonia present. Average gas liquor has following composition:—

Ammonia (NH_3)	=	2·045 per cent.
$(NH_4)_2\,S$	=	0·303 ,,
$(NH_4)_2\,CO_3$	=	3·916 ,,
$NH_4\,Cl$	=	1·423 ,,
$(NH_4\,CNS$	=	0·180 ,,
$(NH_4)_2\,SO_4$	=	0·019 ,,
$NN_4\,S_2\,O_3$	=	0·280 ,,
$(NH_4)_2\,Fe\,CN_6$	=	0·041 ,,

The foregoing are classified as under:—

Free.	Fixed.
Carbonate	Sulphate
Sulphide	Sulphite
Hydrosulphide	Thiosulphate
Cyanide	Chloride
Acetate	Sulphocyanide
	Ferrocyanide

In starting the plant, care should be taken that the valves are in their proper position, and also that the steam is very slowly introduced into the still, otherwise there is a risk of either the joints blowing, or possibly the rings themselves cracking, in which case serious accidents might occur. Having got the stills to the requisite heat, the liquor may be slowly admitted, and the plugs in the gas-pipes from the stills should now be put in their place, (having up to this point been taken out to allow of the escape of steam), otherwise the strength of the acid in the saturator would have been much weakened by the condensed steam. Care should be taken that the liquor in the saturator has always an acid reaction, otherwise the colour of the salt will be effected. The liquor passes from the supply-tank through the heater, where it is raised to a temperature of 200° to 210° Fahr. by means of the spent gases from the saturator, and then into the top tray of the upper part of the still, where it travels, in the case of Walker's apparatus, round the serrated edged hoods (or, in other makes, through the serrated openings of the hoods), and then passes to the next lower tray, through the overflow-pipe at the opposite side of the tray, to the inlet, and so on from tray to tray until it reaches the lime chamber, where it should contain little or no trace of free NH_3. The following table gives the amount of NH_3 given off on the passage of liquor through these trays when good working is obtained:—

	Free.		Fixed.	
1st ring	0·88	..	0·26	
2nd ,,	0·79	..	0·26	
3rd ,,	0·67	..	0·26	
4th ,,	0·60	..	0·26	All CO_2 driven off in this ring
5th ,,	0·45	..	0·26	
6th ,,	0·46	..	0·05	

The liquor before passing into the stills contains 1·15 per cent. NH_3 free, and 0·26 per cent. NH_3 fixed. The liquor now reaches the liming chamber, into which is a constant feed of milk of lime. This is thoroughly mixed by means of live steam passing through a depth of about 18 inches of liquor; the steam keeping the liquor in constant agitation. At this point the Wilton still differs from the others. The liquor, on leaving the "free" ammonia portion, is conveyed through a wrought-iron pipe to a separate vessel, where it is mixed with milk of lime, and afterwards forced again, by means of fresh liquor, into the still, passing down the "fixed" ammonia portion. The lime and liquor having become thoroughly mixed, they now pass down the remainder of the trays until they reach the bottom. Steam is introduced, which, along with the hot gases, passes up the still; being confined to each tray with serrated hoods, through the serrations of which it is compelled to pass, and in doing so also passes through the layer of liquor generally 1½ to 2 inches—the fixed thus being liberated

$$Ca\,(OH)_2 + (NH_4)_2\,SO_4 = Ca\,SO_4 + (NH_3)_2\,H_2O.$$

the fixed ammonia now becoming "free."

The following is the amount of ammonia liberated in passing through the "fixed" portion:—

1st	=	·28 per cent.	ammonia.
2nd	=	·17 ,,	,,
3rd	=	·13 ,,	,,
4th	=	·11 ,,	,,
5th	=	·07 ,,	,,
6th	=	·05 ,,	,,
7th	=	·03 ,,	,,

The gases, on leaving the still, are conveyed to the saturator; but between the still and saturator a catch-box is arranged, as before mentioned. The gases enter the saturator by means of a lead pipe having perforations in order to split up the gases into a number of small streams, and thus more effectually come in direct contact with the acid contained therein. The sulphate of ammonia then forms into crystals, and deposits on the bottom, when it is removed either by means of a scoop or by some other mechanical arrangement.

The strength of acid used should be about 135° Twaddel, as this allows of the working up of the mother liquor, which drains as before described. This mother liquor should always be kept low, for in the stopping and starting of the plant a quantity is always made. The strength of the saturator should be between 56° and 60° Twaddel. Below this there is a risk of the liquor having an alkaline reaction, with the result that cyanogen gas is absorbed. This, along with the iron contained in the liquor, combines with formation of prussian blue ($Fe_7\,CN_{18}$) immediately; the saturator becoming acid again, the iron and lead are precipitated, forming sulphides of iron and lead, turning the salt a black colour. The strength of the acid not being sufficient to dissolve it, it is deposited with ammonium sulphate.

Sometimes when sulphate of ammonia has been standing a short time, a blue or brown layer is formed. This is owing to the iron having been reduced in the saturator by the sulphuretted hydrogen (which is a reducing body), and afterwards being oxidized to the ferric salt by the action of air; these ferric salts being more highly coloured than those of the ferro condition. The red coloration is due to the presence of sulpho-cyanides.

The analysis of sulphate of ammonia is as follows:—

Moisture	2·00	per cent.
Ammonia	24·76	,,
Free acid	0·30	,,

If good work is being done, 1 ton of sulphate of ammonia is made from 2500 gallons of liquor of 10 oz. strength. One ton requires 17½ cwt. of acid at 150° Twaddel, and 3 cwt. of lime.

The waste gases evolved from the saturator—consisting chiefly of H_2S, CO_2, and CN—after passing through liquor-heaters, are conveyed to the condensers, where they are freed of all water and cooled down to below 80° Fahr.; the composition of the gases

at this point being about 28 per cent. H_2S, 67 per cent. CO_2, and a little CN. The CO_2 varies, depending upon how it existed with NH_3; being the highest when existing as the bicarbonate, which occurs when strong ammonia liquor is used for purifying the gas; for CO_2, having greater affinity for ammonia in strong solution, therefore has the power of replacing H_2S in $(NH_4)_2S$, forming the bicarbonate with the liberation of H_2S.

Various ways have been introduced for utilizing with advantage these waste gases, notably the Claus kiln, in which the sulphur is recovered in a marketable form. At works where sulphuric acid is manufactured, it is burned in the sulphur burners into sulphurous acid, which is converted into sulphuric acid very economically. Ammonia liquor contains on an average 4 per cent. sulphur as H_2S. This will give on burning the waste gases 20 per cent. of the total acid required for the manufacture of $(NH_4)_2\,SO_4$; the remaining sulphur combining with the lime forming CaS.

Another method has been recently brought out, and can be adopted in small works with great advantage. The H_2S coming from the condensers is burned in a furnace, and the SO_2, along with the excess oxygen which is admitted, passes into towers packed with scrap iron, where a reaction takes place, and sulphate of iron is produced. This is dissolved by water or liquor passing through; the heat of the gases concentrating the liquor sufficiently to cause, when the latter is cooled down in tanks, crystals of iron sulphate to separate, and these are removed by means of a scoop. The mother liquor left again passes down the first tower, when concentration is repeated. Clean water is sent down the second tower. At the foot of each tower, tanks are arranged for collecting the passing liquor. The third tower is packed with limestone. The gas ascends this, after leaving the second tower. At the same time, waste ammonia liquor is run down; the alkalinity neutralizing the sulphurous acid, forming soluble salts, which are taken into solution, and pass away as a practically inoffensive effluent. By this means, the last trace of acid is neutralized; and carbonic acid and steam, which practically constitute the final discharge, pass into the chimney.

$$H_2S + O_2 - H_2O + SO_2$$
$$Fe + SO_2 + O + H_2O - Fe\,SO_4$$
$$Ca\,CO_3 + H_2\,SO_3 - Ca\,SO_3 + CO_2 + H_2O$$

The "devil water" (this is the liquor collected from the seal-pots attached to the waste gases condenser), under normal working, should not be above 17 per cent. to 20 per cent. of the ammoniacal liquor used. It has an extremely objectionable smell, which accounts for its name—"devil water." Its disposal has been the cause of a lot of trouble, and has resulted in many cases in heavy penalties. The best way of disposing of this water is to collect it in covered tanks, the air outlet of which should be provided with a small purifier charged with oxide of iron. During certain periods of the day, the ammoniacal liquor is shut off from the stills; and the "devil water" is run down, while steam passes up the stills. The result is that all objectionable gases—H_2S, &c.—are driven off, leaving practically clear liquor at the outlet. The H_2S, CO_2, &c., after cooling, is conveyed, by means of the waste-gas pipe, to the sulphur burners, and is there burnt to SO_2 for the manufacture of sulphuric acid.

The spent ammonia liquor from the still is conveyed away through pipes into settling-tanks, where the spent lime settles out in a soft pasty mass, which contains a quantity of calcium sulphide, and should never, on any account, get into the sewers or watercourses, for it is sure to give off H_2S, especially if the other effluent contains acid properties. In some cases it is used, with a little fresh lime and a good amount of cinders, to form a very well-setting and somewhat hydraulic mortar. The spent liquor, generally speaking, contains about 0·2 per cent. of solid matter, which consists of Ca CNS and Ca S, Ca S_2O_3. This is run away either into rivers or sewers; but the temperature should not exceed 108° Fahr. In some cases, chamber filter-presses are used for collecting the spent lime. This is an advantage where the spent lime has to be carted a distance, as the water is much reduced.

[In illustration of the paper, models were exhibited of the Walker and Wilton apparatus.]

A FLUELESS GAS HEATING-STOVE.

If simplicity and a high heating power are the only two essentials for the making of an efficient gas-stove for the warming of apartments, then the "Household" gas-stove, to which our attention has been called, is a heater, the pretensions of which in these respects are easily substantiated, and of no mean order. But there are other points about a gas-stove of which people who know something of these things like to have information. For instance, there are the questions of whether adequate provision is made for the removal, or the prevention of the escape, of the products of combustion, whether the stove secures its effectiveness in an economical manner, and whether it is durable. Unless special means are provided for dealing with the products of combustion, there are many gas consumers who would not think of having a stove burning with atmospheric flames in any of their rooms, and there are others who—perhaps in the opinion of some are a little over-finical—would not dream of having even a condensing-stove in their rooms without a proper flue-outlet. But here we have a stove introduced to us by the "Household" Gas-Stove Company burning with an atmospheric flame in which there is no provision made for condensation, and an entire absence of a flue. Yet in a small room in which one was burning a few days since, it must be confessed that there was not a suspicion of odour of any kind, nor of that stifling sensation which—entering the room in a somewhat dubious frame of mind regarding the claims put forward for the stove—had been expected. We can only state this as an experience of a short trial. Nor shall we attempt to try to account for it, for it must be said that, beyond the peculiar build of the burner employed, there is nothing extraordinary about the construction of the stove to explain it. However, it would be extremely interesting to have this simple warming appliance subjected to a thorough investigation by one of the recognized experts of the gas industry.

Meanwhile, there is the testimony of Professor Watson Will, the Principal of the Metropolitan College of Pharmacy, who has made exhaustive tests of the system, and has expressed the opinion that the burner can be used as a means of heating rooms without a flue and with perfect results. He says: "This burner, which is quite on a new plan, more particularly in the manner by which the admixture of coal gas and air is brought about, has been submitted to a careful examination, in order to ascertain if the products of combustion were likely to contain any imperfectly consumed gas. After keeping the burner going for some time, the products of the combustion were collected, and submitted to analysis with most satisfactory results. The products on examination were found to be carbonic anhydrine, moisture, oxygen, and nitrogen. There was a total absence of acetylene; and only after a considerable time a very minute trace of carbonic oxide, but in such minute quantity that one must regard the combustion as perfect in every respect, and will claim for this burner a very high place as a source of heat, both for heating rooms and cooking. One of the advantages is the very moist heat obtained by its use." With this testimony, the point may be left for others to pursue.

Mention has been made of the peculiar construction of the burner; and a brief description may be introduced here before referring to other matters. The explanation should be prefaced by the statements, first, that Mr. Fletcher Moulton, K.C., has pronounced that, in his opinion, the patent is valid; and, secondly, that it is to the construction of the burner, which enables a thorough admixture of the gas and air before the point of combustion is reached that the exceptional merits claimed for the stove are due. If reference is made to fig. 1, the outward form of the burner will be appreciated at a glance; and there is little to say concerning the internal parts. At the foot of the stove there is a bunsen burner, which, instead of being used for its original purpose, is merely employed as a preliminary mixer of the gas and air. The mixture then escapes into the cylindrical stem, the bottom part of which is of conical form. This is fitted into a circular base perforated (as shown) with air-admission holes; and through these the mixture flowing into the stem draws a larger supply of air—the proportion, it is said, reaching 90 per cent. of air to 10 per cent. of gas. The gas and air passing up the stem enters a second mixing chamber formed by a screen and inverted cone, finally issuing for consumption at the head of the stem, which has a ring of perforations. Above the burner is fitted a hollow head of convex form, perforated at the top, and of about double the diameter of the tube beneath. This acts as a deflector of the flames, and as a radiator of the heat. After being in use for some little time, no deposit of any kind could be found on the radiator. There is a ring (as shown in fig. 1) of non-conducting material interposed in the tube just at the base of the upper mixing chamber. There is nothing else to explain about the burner; and the more that we think over the matter, the more are we interested in the statement of perfection by Professor Will. Is that perfection solely and directly the effect of the mixing process to which the gas and air are subjected? Professor Will says that it is. We should like a gas expert of special experience in this line of research to look further into the matter.

Fig. 1.

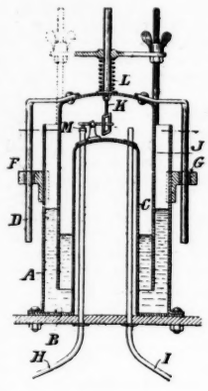
Fig. 2.

However, sufficient explanation has been given to show that, with a stove of such simple construction, the depreciation of the parts through use must be very slow; and, as to the economical aspect, one of the stoves consuming about 5 cubic feet of gas is sufficient for the heating of a room 20 ft. by 16 ft. by 12 ft. The stove is made in five sizes, consuming from 4 up to 15 cubic feet; so that it cannot be said to be extravagant. In fact, the verification of the claims would place this warming arrangement in a leading position among gas-stoves in regard to the points of economy, effect, and simplicity. The casings are made in many ornamental styles; the one depicted being of the plainest type. In addition to its use as a heating agent, the stove can be supplied in form suitable for household or business purposes.

REGISTER OF PATENTS.

Gasholder for Gas-Engines.—Panvert, P. A., of Paris. No. 21,115; Oct. 21, 1901.

This invention is intended to render the supply of gas to gas-motors more constant, and, consequently, to diminish the consumption of gas; this being effected by means of a contrivance consisting substantially of a bell, beneath which the gas-inlet and outlet-pipes open—the bell being placed in a receptacle filled with water, and the whole contrivance acting in the manner of a gasholder.



Hitherto, for the purpose of rendering the supply of gas to the motor constant, it has been the practice to employ bags made of linen covered with india-rubber, or india-rubber entirely. The elasticity of the former, the patentee states, is "altogether insufficient to allow of their yielding properly to the sudden variations of gas pressure, the result of which is that variations of similar extent are produced in the action of the motor, and, consequently, there is an excessive consumption of gas." The employment of india-rubber bags, he admits, partially obviates this disadvantage. But india-rubber "is expensive, deteriorates quickly, and after a certain time, as the consequence of a kind of molecular transformation, becomes porous and brittle, and allows a portion of the gas contained in it to escape."

The apparatus which the patentee proposes in substitution of the bags consists substantially of a cylindrical body A, the bottom B of which is in the form of an inverted socket forming a dead space cylinder C. In the annular space left between the dead space cylinder and the cylindrical body A, a bell rises and falls; being guided by two rods D E sliding in sockets F G. A spiral spring L at the top of the bell J has a constant tendency to lower it. The apparatus is completed by two pipes running up in the interior of the dead space cylinder, and extending to a suitable height above the top of the latter. One of these pipes H acts as the gas inlet-pipe, and the other I forms the gas-outlet to the motor. The first of these two pipes is surmounted by a valve M, the rod of which pivots around a support fixed to the top of the dead space cylinder, and is connected with the bell J by means of a rod K.

Supposing the annular space between the cylinder A and the dead space cylinder C be filled with water to a height sufficient for forming a hydraulic seal, the gas which enters fills the space left free in the upper part of the gas-pulsator, and then flows through to the motor. If the pressure of the gas be reduced, the bell J falls under the action of the spring L, and forces a certain quantity of the gas stored in the upper part of the apparatus towards the outlet-pipe I, thus immediately preserving a constant supply. Supposing, on the other hand, that the pressure is increased sufficiently to overcome the resistance of the spring, the bell will rise and close the gas outlet-valve M. Immediately the pressure becomes normal, the bell will fall again and re-open the gas-inlet.

Slot Meters.—Cooney, H., of Tooley Street, S.E., and the Liverpool and London Meter Company, Limited, of Liverpool. No. 14,646; July 1, 1902.

One of the chief objects and effects of the present invention is to simplify and cheapen the cost of manufacture of slot-meter mechanisms, and also to improve such mechanism so that it is not so liable to become deranged or defective. One of the main characteristics by which this is accomplished is the separation of the gas-inlet conduit and the controlling valve from the auto-mechanism, and making it part of, or attaching it to a part of, the meter body.

Fig. 1 is an outside view of the automatic mechanism as applied to an ordinary gas-meter, with the mechanism's outer casing shown in section. Fig. 2 is a view from the inside of the meter showing the parts of the auto-mechanism disposed with in the upper part of the meter. Fig. 3 is a cross section through the mechanism and gas-inlet passage; while fig. 4 is a section showing this passage in outside view, and the mechanism beyond.

Referring to the drawings, A is the chamber on the upper part of the meter, on and in which the meter-mechanism is disposed. B is the case on the outside of the chamber A, within which the mechanism shown in fig. 1 is disposed.

C is the coin-receiving wheel, and part revolved by the user of the meter. D is the hand-actuating wheel. E is the gas-inlet conduit fixed or formed on, and constituting practically an integral part of, the case A; and F is the case in which the controlling valve is placed and works—it being disposed within the end of the chamber A. The gas regulating or controlling valve is designated G, and is mounted on a shaft H supported by, and projecting through, the valve-casing F—the gas-passage from the inlet-pipe E into F being by way of the aperture I. When a coin, or succession of coins, is or are introduced into the apparatus, and the handle D and wheel C are revolved, the valve G will move away from the gas-inlet aperture I; and, on the other hand, when all the gas for which prepayment has been made is consumed, the valve G is closed on to or over the aperture I, and the supply of gas is stopped automatically.

The valve-shaft H has on its outer end an actuating lever J, the outer end of which is in the form of a bifurcated cam tappet, having an upper arm K, and a lower arm L, with which the pin M operates. This pin is carried on the circularly reciprocating or rocking-frame N, which is mounted loosely on the shaft O, and carries one end of the shaft P. This shaft serves to effect the return of this frame N, it having fixed upon it at this end a toothed pinion Q, the teeth of which mesh with the teeth of the spur-wheel R, fixed on the shaft O, which shaft and wheel are revolved when the coin-wheel C is revolved. When such action takes place, the wheel Q, and with it the frame N and shaft P, will be moved bodily about the axis of the shaft O; the shaft P and pinion Q being held and prevented from revolving (or revolving only at a very small rate) by the mechanism K L.

Fig. 1

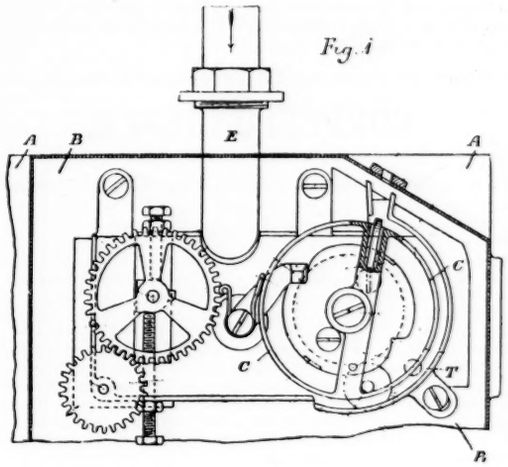


Fig. 2.

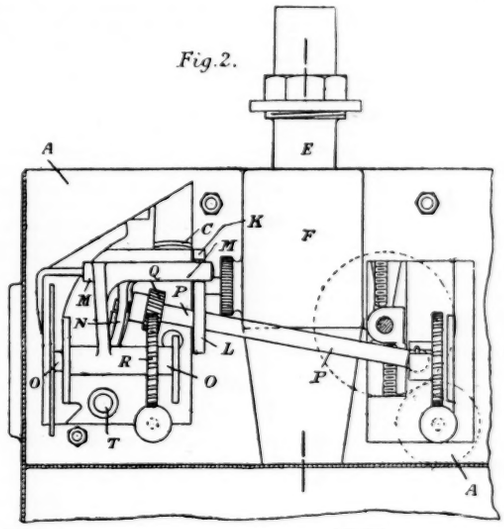


Fig. 3.

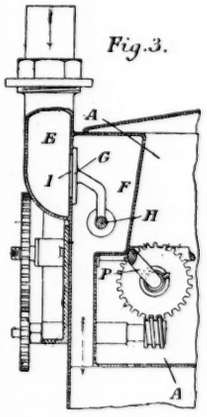
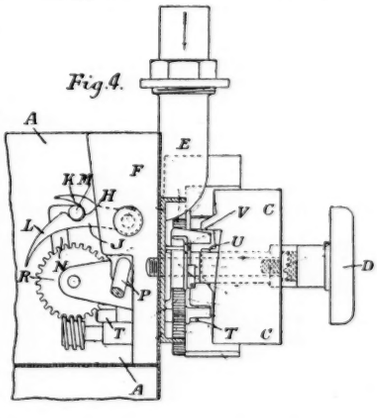


Fig. 4.



When the pin M enters the arms K L (which only takes place when the last portion of the gas for which prepayment has been made is being supplied), it comes in contact with the under surface of the upper arm K; and this surface presents an inclined plane to the pin M. As this pin moves forward in its arc movement, it acts on the inclined surface, and raises the lever J; and when it reaches the back end of this beak, and enters the downwardly hollowed-out gap S in the lower arm L, the valve G will be closed, and no more gas can pass. On the other hand, after a coin or coins is or have been introduced, the pin M acts on the outer edge or shoulder of the gap S, and gives the valve at once a full or large opening. Thus, when the first coin is introduced and the meter set to supply gas after it has been closed, a full pressure of gas supply is produced.

When the maximum number of coins, equivalent to the maximum prepayment the meter is adapted to receive, have been inserted, the apparatus is locked. The locking means consists of a bolt T, which is

pressed out through a bearing in the casing or chamber A by the frame N coming in contact with its inner end—the outer end of the bolt operating in connection with, and coming between, stop projections U V on the inner edge of the wheel C. When the full movement, therefore, of the parts is completed, the frame N pushes the bolt T out between the stops U and V, so that the cam opening in the periphery of the wheel C cannot be moved in line with the coin-slot, and, consequently, no coins can be introduced. When the frame N moves away from the bolt, which takes place when the meter commences to pass gas, the inclined edge of the projection V forces the bolt back into the case A, and out of the path of these projections.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by correspondents.*]

Dangers of Defective Flues.

Sir,—In the recent death of M. Zola we have at last what appears to be an authentic record of a case of suffocation by a defective flue, which this time cannot, by any stretch of the imagination, be laid to the fault of a gas-fire—an arrangement which, up to the present, has had to bear all the blame which rightly should be laid to defective flues, gross carelessness, and wilful defiance both of the simplest instructions and of common sense. In M. Zola's case, the accident, as it occurred, is one not very likely to happen in this country, as the almost smokeless briquettes were used. With English soft coal, the smoke and smell, with a persistent down-draught, are totally unbearable long before the point of danger occurs; and either the fire or the occupants of the room must give way and clear out. With gas, the nuisance, to most people, is not so unbearable as the exhalations from burning coal; hence the dangerous practice of fixing a gas-fire in grates where a coal-fire cannot be used—a common practice even with educated people who certainly ought to know better.

It is unfortunate that the non-technical Press, in commenting on M. Zola's death, raise points and make statements which are both ridiculous and misleading. If a flue has a strong down-draught, which was evidently the case in this instance, the presence of a "crack," or a dozen cracks, in the flue would not have made the slightest difference in the result. One influential London paper states that there was a strong smell of "carbon" in the room; and, as burning or burnt "carbon" has no smell whatever, either as carbon monoxide (CO) or carbon dioxide (CO_2), this statement is foolish and misleading. An absolutely and rapidly poisonous atmosphere can be obtained, quite inappreciable to ordinary senses, by one of the products of combustion of carbon—*i.e.*, carbon monoxide; and carbon dioxide, although inert and not poisonous, causes death by deprivation of oxygen, if it is in great excess in the air.

It is a misfortune that one of the great advantages of gas-fires—*i.e.*, the absence of smoke and filth in a room—with a defective flue should prove a disadvantage in the hands of careless users; and the only remedy is a persistent reiteration of the fact that no fire, whatever the fuel, can be safely used without a reliable flue.

Thos. Fletcher, F.C.S.,
Chairman, Messrs. Fletcher, Russell, and Co., Limited.

Warrington, Oct. 1, 1902.

P.S.—Since writing the above, I see a note of a similar occurrence, reported in the "Manchester Courier" for the 2nd inst. This case is more striking than that of M. Zola, as the sufferer was a medical man, who certainly ought to have known better than to use a "*sanitary*" (!) coal-stove in a bedroom with a "strong down draught in the chimney." To still further improve matters, he is reported to have "put a slate across the top of the flue to try and stop it." After this, we need not be surprised that the general non-technical users get into trouble sometimes. The wonder is that the doctor and his wife are still alive to tell the tale. There is the usual mixture and confusion between carbonic oxide and carbonic acid gases—the former being referred to as the "heavy gas"—and the same old tale about the valley in Italy and the dog which, in its correct form, has "stumped the press" from time immemorial. Now, the credit of this is given to the wrong gas; and no doubt the revised tale will once more start on its travels.—T. F.

Testing Gas of Different Qualities.

Sir,—Your two critical articles on "The Cult of the Gas Examiner," with reference to a book published by Mr. Jacques Abady, I have read with great interest I have not had the advantage of perusing Mr. Abady's book, so whatever comments I have to make must be based on your articles. I do not know what is the "cult of the gas examiner," but I have had practical experience of long standing as an examiner under the old conditions. The position at the present time is very much better than it used to be in the past. Many years back, the old Evans closed photometer was in use, with candles as a standard, which everyone heartily anathematized who had had experience of more modern appliances for the estimation of illuminating power. In addition, the tests were made at fixed intervals—viz., at 6, 7, and 8 p.m. in the winter months, and at 8, 9, and 10 p.m. in the summer months—and the salary was £100 per annum. The Gas Examiner of the present day is paid at the rate of £150 a year; and he can take his tests, with few exceptions, at any time in the day which suits his own convenience. Furthermore, he has the advantage of the table photometer and the 10-candle pentane standard, which expedite and simplify the work.

The present system of official gas testing, apart from rendering the work of the examiner more simple, has two marked advantages which conduce to accuracy. The one is the use of a standard which is strictly reliable, and the other the abandonment of the rigid 5-feet consumption, and the substitution of burning up the gas to a constant light of 16 candles. In the long series of tests which I made for the Commercial Gas Company in connection with the Photometrical Commission on Standards of Light, apart from minor questions, one point was unquestionably predominant, and that was that the regulation of the gas up to a 16-candle flame was more just to low-grade gases than the old system. I think that my recent article (*ante*, p. 486) on the different illuminating values of the lower-grade gases, when tested under varying conditions, must be a powerful argument as to the necessity of employing a modification of testing with different qualities of gas. This much is certain, that with the advent of 14-candle or possibly 12-candle gas in the immediate future, a special burner will have to be employed; but, failing this, the Sugg "London" argand could not be used as a standard, unless the gas was turned up to a 16-candle value.

H. Leicester Greville.

Commercial Gas-Works, Stepney, E., Oct. 1, 1902.

Milbourne's Patent Purifiers.

Sir,—In your report of the proceedings at the recent annual general meeting of the Association of Dutch Gas Engineers (*ante*, p. 824), wherein a brief description is given of my patent system of purifiers, there is a slight clerical error which I shall be glad if you will kindly permit me to correct. In this report the following passage occurs: "It appeared from a communication on Milbourne's patent purifiers that with this system *no* connections between the vessels were *saved*." This sentence should either read "*the* connections between the vessels were saved," or "no connections between the vessels were *used*."

R. J. Milbourne.

Wellington (Salop), Oct. 3, 1902.

Combating Trade Unionism by Combination.

Sir,—It is gratifying to read the "Editorial Note" in the last number of the "Journal" on the unmasking of Trade Unionism again by itself. All keen observers have long recognized the fact that Trade Unions have throughout the whole of their existence adopted the policy of class war. Some of us know it from actual experience, and are daily expecting to be again made the target. If, after your warning, gas managers fail to realize the serious importance to them of the attitude of Trade Unionism, they will soon find that their position is hopelessly subordinated to the dictates of the Gas Workers' Union. Already many instances have occurred where the iron heel of this Union has been felt; but, fortunately, there have been some managers who have had the courage (supported by their directors) to rise up like Sir George Livesey, and Mr. Thomas Canning, of Newport, and successfully grapple with the tyrant.

It is not a question of fair dealing between master and man, but it resolves itself into this—that the stoker is to be virtually master of the gas manager and his directors; dictating as to what number of men, and who, must be employed, and whether or not any labour-saving machinery may be used. It therefore behoves gas companies to seriously consider the position, and agree to combine together to defend one another against the common enemy. It is not a difficult matter. It could be discussed at the meetings of the Gas Institute and the Institution of Gas Engineers, and a Committee could be formed to consider the best plan of action. In the event of the combination being formed, it would be next to impossible for a strike to take place with any chance of success on the part of the stokers; and, further, better relations would exist between men and master.

J. W. Russell Wall.

13, *Cross Street, E.C., Oct.* 3, 1902.

The Affairs of the Greenock Gas Department.

Sir,—Having been from home for the past two weeks, I have only to-day had the pleasure of seeing the "Journal" for the 16th inst.; and I notice that your correspondent is at his old game. I have no desire to enter into a controversy with a person I know nothing about, and would have paid no attention to the statements which appeared in your issue of the 2nd inst. had it not been for the personal element introduced therein. Your correspondent says: "I do not know what Bailie Campbell said on July 16, 1901; but I find that he submitted the estimates for the year to June 30, 1902, at a meeting of the Corporation on Aug. 20, 1901." Now, your correspondent, in his first statement, which appeared in your issue for the 2nd inst., was directing attention to the coal carbonized and the estimated yield per ton for the year ending June 30, 1902, and comparing the same with the year ending June 30, 1901; and he stated: "I find that the estimated yield for the past twelve months was 9600 cubic feet per ton." I now say, without hesitation, that there is no such statement as the above on record, and that the only estimate of the "yield per ton . . . for the past twelve months" is the one given by Bailie Campbell at a Corporation meeting on July 16, 1901. About the 900 tons of coal in dispute, your correspondent says: "Mr. Mitchell . . . might have said who disputes it." My answer is that the Manager, Mr. Ewing, in his monthly reports for May and June last, "disputes it."

Your correspondent says: "The gas made from July, 1900, to April, 1901, may have been anything it liked; I was not referring to it, but to the period from July 1, 1901, to June 30, 1902. Besides, Mr. Ewing was not at Greenock till November, 1901." Here again your correspondent betrays his ignorance. In the first place, Mr. Ewing was introduced by the writer to the Greenock Gas-Works as Manager on Nov. 15, 1900; and, in the second place, the statement made anent the estimated yield per ton of coal can only bear one meaning. These are his words: "I find that the estimated yield for the past twelve months was 9600 cubic feet per ton, which was 352 feet more than was derived during the preceding year. Instead of the expected quantity, however, the yield was at the rate of 10,015 cubic feet per ton, which was 767 feet above the yield the preceding year, and 415 feet above the estimate. But during the first ten months of last year, the yield was

10,215 cubic feet per ton, which was about 1000 feet more than the yield in the preceding year. There must have been something, then, in the other two months which brought down the average. Mr. Ewing finds this to be in the working of an incomplete installation of machine stoking." As the "incomplete installation of machine stoking" was not working for two months in the year ending June 30, 1902, and was working for two months in "the year from July 1, 1900, to June 30, 1901," it must have been that "period" your correspondent was "referring to," whether he knew it or not. It could be no other. In fact, the make of gas in May and June in each of the years proves beyond doubt that your correspondent was "referring to . . . the gas made from July, 1900, to April, 1901." The gas made in May, 1901, was 9079 cubic feet, and in June 9131 cubic feet; but in May, 1902, the gas made was 10,034 cubic feet, and in June 10,267 cubic feet per ton, and for the first ten months of 1900-1 the average make was 9261 cubic feet, and in the first ten months of 1901-2 the average make was 9702 cubic feet.

After commenting on other matters connected with the year's working, your correspondent, as if to emphasize his admiration for Mr. Ewing, says: "I am anxious that the facts as to the excellent working of the undertaking by Mr. Ewing should be acknowledged." I fear your correspondent was so "anxious" on the subject that he forgot one or two very important points which are quite as worthy of notice as those he has mentioned. For example, the illuminating quality of the gas made since Mr. Ewing became Manager has been reduced, on an average, by 3·20 candles; yet the gas is not reduced in price. The unaccounted-for gas has been increased by about 2 per cent., and for the coming year the price of coal is about 8d. per ton less than it was for the year ending June, 1900. The estimated quality of the gas is 2 candles less than it was for the same period, yet the price of gas is 3d. per 1000 cubic feet higher. These are surely important "facts" which an impartial correspondent should not have lost sight of when showing up "the excellent working of the undertaking by Mr. Ewing."

Now, allow me one or two words on the letter signed William Ewing in the same issue of the "JOURNAL." I have no fault to find with Mr. Ewing in writing you on a subject which must deeply concern himself, but I do find fault when the truth is not written. Mr. Ewing in his letter says: "I regret to note, in this connection, a communication on the subject in your issue of the 9th inst., by ex-Bailie Mitchell, past Convener of the Gas Committee, in which he—unwittingly, I doubt not—brings forward figures relative to the year ending June 30, 1902. Bailie Mitchell's figures are correct, inasmuch as the yield of gas for ten months ending April 30, 1901, was 9261 cubic feet per ton; and your correspondent is also correct in quoting a make per ton of 10,215 cubic feet for a period of ten months in the year ending June 30, 1902." This statement Mr. Ewing must know is not strictly correct. There is only one month "in the year ending June 30, 1902," in which the yield per ton reaches 10,215 cubic feet. If any person knows that "fact," it should be Mr. Ewing.

THOS. MITCHELL.

27, *Lyle Street, Greenock, Sept.* 30, 1902.

LEGAL INTELLIGENCE.

LAMBETH COUNTY COURT.—Thursday, Oct. 2.

(*Before His Honour Judge* EMDEN.)

South London Electric Supply Corporation, Limited, v. Morris Gouldston, trading as M. Gouldston and Co.—The "Free Installation" Question.

In this case, the defendant, who is a tailor carrying on business at No. 1, Princess Mansions, Coldharbour Lane, was sued to recover £1 3s. for current supplied and rent of meter.

Plaintiffs' representative put in an agreement under which the defendant bound himself for three years to take the current and pay for the installation, which cost £12, at the rate of 10s. a quarter.

Defendant said he could not use the light. It was so bad that he had to put candles in his window; and, besides, it was three times the price of gas. He told the Corporation he would pay for the first quarter, but that as the light was very bad and expensive he did not want it any longer, and they had better remove the meter.

Judge EMDEN: The agreement specifies that it shall be operative under any circumstances for three years. I have no hesitation in saying that these so-called "free installations" are very expensive ones indeed. It is very hard, but I am afraid I must give judgment for the plaintiffs.

Mr. TURNER, barrister, said he was not in the case, but he should like to be allowed to point out that some time ago it was held in the High Court that one of these agreements could not be enforced, as the light supplied was bad.

Judge EMDEN: Certainly. The agreement does not permit the Corporation to supply anything in the way of light. I should like evidence on that point.

Defendant: I had 12 lights, but they were so poor that I had to buy candles. I was advised, at the offices of the Corporation, to get 20 or 30 lights; but this would be altogether too expensive.

Judge EMDEN: These so-called "free installations" are very attractive to look at, but they bind people for three years, and are very serious matters indeed. This is not the first case of the kind I have had before me; and I do wish the public would be more cautious in signing these agreements.

In the result, the case was adjourned, so that the plaintiffs might consider whether they would keep the defendant to the agreement.

Friday, Oct. 3.

The hearing of this case was resumed to-day.

Judge EMDEN asked if the plaintiffs intended to bind the defendant down to his agreement, whether he used the electric light or not.

The MANAGER for the plaintiffs replied in the affirmative.

Judge EMDEN: Your agreement is different to the agreement of a gas company. I do not consider it fair that a man should be charged whether he uses the light or not.

The MANAGER: We have to get the cost of the installation back.

Judge EMDEN: You would soon get the cost of the installation back at £2 a year.

The MANAGER: No, sir.

George Brace, who lived next door to the defendant, deposed to noticing the bad light furnished by electricity. It was nothing equal to that given by gas. Defendant told him he would have to go back to gas, which, besides being better, was much cheaper.

Defendant, in reply to an observation from plaintiffs' Manager, said he put new lamps on every fortnight. He was advised by the Corporation clerks to take off the globes. He did so, but there was no improvement.

The MANAGER said defendant's premises were close to the works. It was merely a question of extra expense, not of bad light. Defendant alone had complained of bad light.

Judge EMDEN: Do not say that. I had a case before in this Court where there was a complaint of bad light against your Corporation.

The MANAGER: Under the Act they can summon us if we supply current which does not come up to the proper pressure.

Judge EMDEN: Yes; poor people are likely to summon you for that. You won't let defendant off this three years' agreement?

The MANAGER: Certainly not.

Judge EMDEN: Well, then, I am reluctantly obliged to give judgment for the plaintiffs. The moral is that people should not sign these agreements. Though I am compelled to enter judgment for the plaintiffs, I make no order as to costs, as I consider the agreement one-sided.

Dispute as to the Testing of a Reservoir.

In the Chancery Court of the County Palatine of Lancashire, last Tuesday, Mr. George Bell applied for an injunction to restrain the Corporation of Warrington from entering upon, and letting water into, a new reservoir constructed by the plaintiff for the defendants at Winwick. Mr. Mansfield appeared for the plaintiff; while Mr. Radford, for the defendants, supported a summons to stay all proceedings in the case pending its hearing and determination by an arbitrator, as provided by the contract. Mr. Mansfield explained that the plaintiff had contracted with the Corporation for the construction of a new reservoir at Winwick, for some £20,000. Work was commenced on April 2, 1900, and was to be completed in sixty weeks, which would expire on June 4, 1901. The original contract provided for the employment by the plaintiff of another firm—Messrs. Callender and Co.—to line and cover the reservoir with bitumen sheeting, and for the casing of the concrete with a cement mortar facing. The Engineer to the Corporation, however, later on elected to give instructions to Messrs. Callender and Co. direct, and also to forego the cement facing. Later on, the defendants, before the expiry of the time for which the Contractor was responsible, sought to take possession of the work for the purpose of letting in water in order to test the soundness of the reservoir; but the plaintiff demurred to this unless he had an indemnity, which the defendants declined to give. Mr. Mansfield submitted that, the defendants having chosen to vary the contract, and in one important respect to take the matter out of the plaintiff's hands, he was entitled to an injunction, which the Court clearly had power to grant, notwithstanding the arbitration clause in the contract. Mr. Radford, however, argued that defendants were clearly within their rights under the contract in what they had done, and that arbitration in case of dispute was provided. The Deputy Vice-Chancellor (Mr. Registrar Willis), though conscious that the arbitration clause did not restrain him, said he did not think this was a case for an injunction. If the plaintiff had any just cause of complaint against the defendants or their Engineer in regard to the cement plastering or other matters, he could and should have taken action at a much earlier date. Then, on the summons, the arbitration clause was exceedingly wide; and without expressing any opinion on the merits of the case, he thought it was essentially one for an arbitrator to deal with. The order would be for the proceedings to be stayed until the matter had been referred to arbitration.

The Incandescent Trust, Limited.

A creditor's petition, presented by Winifred Mundler, for the winding up of this Company was in the list for hearing on Wednesday last by Mr. Justice Jelf, the Vacation Judge. The petitioner is a creditor who has recovered judgment for £80, and application had been made on behalf of the Company to set aside this judgment. It was stated that, on the previous day, his Lordship in Chambers had appointed a Receiver; and as the petition could not be disposed of until after the application to set aside the judgment had been settled, it had been arranged that the petition should stand over until Wednesday, Oct. 29. His Lordship ordered that this should be done.

An Undischarged Gas Account.

At the Selby Petty Sessions, on the 29th ult., Mr. William Horsnell, of Ossett, was summoned by the Selby Urban District Council for the non-payment of a gas account alleged to be due from him. Defendant denied liability. The case for the prosecution was that in the erection of the Selby baths the contractors had proportioned to them the gas consumed on the premises while the work was being done. The others had paid, with the exception of defendant. Mr. Brookes, who appeared for the defendant, contended that the Court had no power in the matter, as the account was rendered in December, 1901, and ought to have been discharged within six months. His client was prepared to meet the Council in the County Court on the subject. The Bench dismissed the summons, which sought to recover the value of 21,000 cubic feet of gas at 3s. 6d. per 1000 feet. Mr. Brookes asked for £3 3s. expenses, which were granted.

MISCELLANEOUS NEWS.

COMMERCIAL GAS COMPANY.

The Ordinary Meeting of the Proprietors of this Company was held last Thursday, at the Cannon Street Hotel—Mr. W. G. BRADSHAW in the chair.

The SECRETARY (Mr. H. D. Ellis) read the notice convening the meeting; and the Directors' report and the statement of accounts, which were summarized last week, were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Ladies and Gentlemen, I do not think I need take up much of your time to-day, because the accounts show very clearly the position of the Company; and there is not a great deal outside the report and accounts which calls for special observation. I must say the accounts came to us with a pleasant surprise; for the results were better than we had ventured to anticipate. We are able to recommend you an increased dividend, and to carry forward a larger sum of undivided profit than has been the case for some years past. I propose now very briefly to compare some of the leading figures with those of the corresponding half of last year, in order that you may be able to form a correct opinion of the position of the Company, and see how it is the improvement has come about. In the first half of 1901, we sold 1324 million cubic feet of gas, the gross cost of which was £210,232. Residuals produced £48,993, which reduced the net cost of gas to £161,239. We were then charging 3s. per 1000 cubic feet; and our receipts for gas and the rental from meters and stoves came to £205,889. The net profit was, therefore, £44,650. Now, in the half year under review, we sold 41 million cubic feet more gas—making the total sales 1,365,630,000 cubic feet. The gross cost was £181,050; and, the residuals producing £46,269, the net cost was £134,781. Then we were charging 2s. 8d. per 1000 cubic feet of gas, instead of 3s., so that the receipts were less. They amounted to £191,914. But the net cost of gas being so much less, the profits were improved; and they amounted to £57,133. In a word, though our receipts were less by £14,000 in round figures, the cost of gas was less by £26,500; and therefore the profit was more by £12,500—that is to say, we were selling gas at 4d. per 1000 feet less, but we obtained £12,500 more profit. To sum up, and putting it very briefly, last year we were able to pay a dividend of 12 per cent. and 9 per cent., but our profits fell short of the amount required to pay it by no less than £6579. This year we recommend a dividend of 12½ per cent. and 9½ per cent., and there is left, after paying the dividend out of the profits of the half year, a surplus of £4279. Adding this to the amount brought forward from the December half of last year (£249), we shall have in hand in aid of the current half year the comfortable sum of £4528. I venture to think you will regard this as a very satisfactory result. Now the question comes, to what is this improvement due? I say it is due to two causes. Principally, it is due to cheaper coal and oil. You will remember that, in the first half of 1901, for the first three months of the year (the winter three months, in which we sell two-thirds of the half-year's gas), we were paying 16s. a ton for our coal; and it was only during the last three months (the summer three months) that the price was reduced to about 8s. 11d. During the whole of the half year under review, we were paying something less than 8s. 11d. per ton of coal. So you see coal was a great deal cheaper; and oil, I am happy to say, shows a larger reduction in price. Our saving would have been much greater, and our profit considerably more, if it had not been that coke gave us a very disappointing result. We sold 4100 tons more coke than in the corresponding half of last year; but we received £6360 less for it. The cheaper coal and oil together are the principal cause of the improvement, but not the exclusive cause. I am happy to say one cause of the improvement is better working all round. I have many particulars showing this, but will only trouble you with two. First of all, the gas made per ton of coal carbonized this half year was 10,429 cubic feet; while in the corresponding half of last year it was only 10,000 cubic feet. Then the coke produced per ton of coal was 9 cwt. instead of 8½ cwt.—an improvement of ½ cwt. Tar also gave a gallon more per ton of coal. This is clear proof of improved working all round. As a second proof, our carbonizing wages show the gratifying reduction of ⅝d. per 1000 feet. This does not mean that our men individually are paid less wages, or that we are employing fewer men. But the work is being done more thoroughly, and therefore more economically. I mention this as a proof of the good feeling that exists among all classes of our employees; and I think it is due to the managers and foremen at our stations, and to the workmen who have done so well under them, that I should mention it. When I have said that the sales of gas show the satisfactory increase of 3 per cent., as compared with an increase in the case of the South Metropolitan Company of 4½ per cent., and a decrease of ¾ per cent. in the case of the Gaslight and Coke Company, I think I have said all I need to show you that the position of the Company is sound and prosperous. Turning for a minute to the capital account. The increased sales of gas have reduced the ratio of our capital from £427 per million cubic feet of gas sold to £400 per million. This is a very low figure. I think I have the authority of Sir George Livesey, in his evidence before Sir James Rankin's Committee, for saying that it is a moderate figure; and you may take it for granted that our works are worth more than the amount at which they stand in the balance-sheet. Now, there is one item in the capital account which has not appeared in it before; and I should like to explain it. That is the expenditure of £2665 on account of a new steamship. You are aware that our largest and newest works are situated at Poplar, on the River Lea. Ever since the establishment of those works in 1876, it has been necessary to tranship our coal in the River Thames out of the ships which brought it from the North into barges, to take it up the Lea, and then to take the coals out of the barges into the works. This has been a costly process. Now, Poplar is our only station where we can expand. At the Wapping works (which are situated on the Thames, and to which coal can be brought direct from the North in steamers), we have been working night and day, summer and winter, and there we have not an inch of room on which we can enlarge the works. Our other works at Stepney are situated on a canal; and, in addition to the cost of the barging, we have to bear the expense of canal dues. So that Poplar is the only place where we can extend at all. Now it is of the utmost importance, as you will see, that we should be able to take our coal to Poplar as cheaply as possible, and during the last few months, we have tried the experiment of taking a steamer directly up the Lea to the works; and I am happy to say it has been attended with complete success. But we were only able to hire a very small steamer; and the running expenses of a small steamer are proportionately very great. It was clear to us that, if we were to get the full benefit of the economy, we must construct a larger steamer in a special manner, to enable us to meet the difficulties of the river, and so that it might get round the sharp bends and underneath the Lea bridges. Hence the item of £2665 on account of a new steamship. This steamer is almost ready for delivery; and when she is at work, we shall be in a position to save the cost of barging and the shipowners' profit; and as we are making at Poplar nearly half of the quantity of the gas sold, the economy ought to be a very substantial one. Now, when I mention that, in addition to the sum charged in the capital account for new works and mains, the revenue account shows that more than £30,000 has been spent on renewals and repairs, I think you may rest satisfied that the upkeep of your works is very handsomely provided for. I do not think I need say any more on the capital account. In the revenue account, there is also an item which has not appeared before—that is, "Profit sharing, £3211." This sum may seem to you rather a large one; but it represents the whole cost of the profit-sharing for the year ended June 30 last. In future, in the December half year, we propose to charge a sum for this purpose; so that the cost may be distributed over the whole year instead of appearing all in one half-year's accounts. The question you will naturally ask us—and it is a question you are fully justified in asking—is: "Does profit-sharing pay? Are we shareholders getting our *quid pro quo*—a proper return for the outlay?" Well, the system, so far as it has been tried in this Company, is still in its infancy; but I have no hesitation whatever in saying that it does pay. When I say this, I do so without considering what I have heard of its successful results in other companies, and only from what I have seen and heard in our own Company. Mr. Jones and the managers of the stations are unanimous in saying that the establishment of profit sharing has done a great deal to remove that attitude of suspicion with which employees are too apt to regard their employers in the present day. The work is carried on distinctly better, and the conduct of the men was never more satisfactory than it is at the present time. I am perfectly convinced that a considerable part of the improvement to which I alluded just now is due to this better understanding with our men. I repeat, however, that the system of profit-sharing is still in its infancy and still on its trial. You may rest quite satisfied that, so far as the proprietors and customers of the Company are concerned, profit-sharing does pay, and is satisfactory; but when I come to look at it from the point of view of one who is responsible for the management of this Company, I confess I have some feeling of disappointment. I will explain what I mean. In our system the bonus is calculated on the annual wages of every man; and on the 30th of June it is declared. Half of the bonus has to be invested in the names of Trustees until a man has sufficient to enable him to purchase £5 of our stock, when he is entitled to receive a stock certificate in his own name. The other half of the bonus is withdrawable at his option. We have tried to persuade the men to leave that withdrawable half with us, in order that it may be accumulated with interest to form provision for the emergencies of life or for old age. The men in other companies for some years have seen the wisdom of this course, and they do leave a large proportion—the largest proportion—of the withdrawable half of the bonus with the Directors, in order that it may be so accumulated; but this, I regret to say, is not the case with our own men. A very large proportion—a very disappointing proportion—of them have withdrawn the whole of the withdrawable half of the bonus. They were perfectly entitled to do that. It was part of the scheme that they should have the option; but we expected we should persuade them to be thrifty and to put the money by for a rainy day. I am told that the men merely wish to handle the money for once and to make sure that it is real and not merely a book entry or phantom dangling before their eyes, and that next year we shall find a considerable number of them leaving it with us. I sincerely hope it will be so, because I feel that if, after they have had a fair trial, we find that we are not realizing all that was expected from the profit-sharing system, and the men are not deriving that permanent benefit which was anticipated, we shall then have to consider whether we can justifiably continue to ask you to contribute this sum out of your profits—at any rate, in the case of those who persistently withdraw their half bonus, and therefore fail to reap the benefits that the system was designed to bring to them. I hope this will not be the case. Of course, part of the scheme of profit sharing is that the men should become shareholders in the Company; and you can readily see how the withdrawal of half of the bonus in a measure defeats that part of the scheme. I generally have a grumble at something; and this is the only grumble to-day. Having made it more in the interests of the men than the Company, I will repeat that our relationship with the men is thoroughly satisfactory, and the reports we have of their work and conduct are invariably good. There is also an item of discounts in the revenue account—£3335. I want to make one remark concerning this. We have evidence that the allowance granted to the large consumers of gas has done a great deal to preserve the most lucrative part of our business, and in this way has enabled us to sell gas at a cheaper rate to the small consumers; so that I believe the shareholders and the consumers alike have benefited from the allowance of these discounts. Now, we have tried during the last half year to make special efforts to increase the number of our coin-meter consumers and the number of consumers who use stoves. In this respect, we have been behind other Companies—partly owing to our expensive capital in past years, and partly owing to the peculiarities of our district. I think we have made some progress. But it has not been so great as we expected; and I have come to the conclusion, after going very care-

fully into the matter, that we cannot hope to reach the standard of the other Companies, for this reason: The native population in our district is being rapidly replaced by the immigration of foreign paupers. I have not a word to say against these foreigners. I believe they are thrifty and law-abiding citizens. But, speaking as a Director of a Gas Company, I find they do not want to take our stoves or coin meters; and this accounts for the fact that we have not so many out in proportion as the other Companies. We shall, however, continue to make the best efforts we can to increase the number of our coin-meter consumers; but I do not think we shall ever reach the standard of the other Companies, owing to this peculiarity of our district. You will have gathered from the report that our Bill has received the Royal Assent. I have already explained to the shareholders the chief provisions; and I do not think I need take up your time in going over them again. I may say, however, that, at the instance of the London County Council, we agreed, after the Bill had left the Commons and before it went into the House of Lords, to make the reduction from 16 to 14 candles in the illuminating power to date from Jan. 1 next, instead of reducing 1 candle then and the other candle at an interval, I think it was, of six months. I explained the alteration in the sliding-scale at the last meeting, with the remark that I did not think that for a series of years your dividends would be any less than they have been. I think I can repeat that remark now. The conversion of the stocks is fully explained in the report; and all I need do is to ask your good offices in helping Mr. Ellis to carry through that somewhat burdensome operation, when the time for it arrives, by sending in your certificates as promptly as possible, so that the work may be carried through rapidly. In those cases where certificates are deposited with bankers for safe custody or otherwise, a letter to the banker asking him to make the exchange would be quite sufficient, and would save the shareholders a great deal of trouble. Another point is, the day of our meeting will be altered. Instead of meeting in April and October, we shall hope to meet with you in February and August. This change will enable us to pay the dividend earlier—an effect which will not be disagreeable to the proprietors. Now, I think I have said all I need about the report and accounts. There is only one other matter I wish to mention, but it is a very important one. I think you are already more or less prepared to hear the announcement that Mr. Jones, our able Engineer and good friend, has decided to retire at the end of the current year. I need not say to a meeting of shareholders of the Commercial Gas Company how much we owe to the skill and ability with which he has managed our affairs, nor need I try to estimate how much of the prosperity of the Company is due to his wisdom and energy. I will only remind you that he came into the Company as long ago as 1869, when he was the Engineer of the Ratcliff Gas Company, which was amalgamated with the Commercial Company in 1875. Mr. Jones then became Joint Engineer, with his father, of the amalgamated concern; and when his father retired in 1880, he became the Chief Engineer and General Manager. Since then, he has been, as you know, foremost in everything connected with the Company. Mr. Jones has been at once the architect and builder of our fortunes. He has initiated every forward movement which has contributed to our prosperity; and it is he who has carried it out. He has been the mainstay of our affairs; but his task has not been a light one. He has had the very poorest district in London to supply. He has had to raise his capital at, I suppose, an average of something like 7¼ per cent.; while the other Engineers of Gas Companies in the Metropolis were getting theirs at about 4 per cent. Yet he has managed to get his capital account down to the satisfactory figure of £400 per million cubic feet of gas, in spite of the fact that during his tenure of office he has designed and erected the whole of the Poplar works, he has rebuilt the Wapping works, and has renewed the Stepney works. He has, moreover, supplied gas at a price which has compared favourably with the charges of other companies; and, in fair weather and foul, he has enabled his Directors to distribute handsome dividends. I think these facts speak more eloquently of his services than any eulogium I could pronounce. I will only add this—I believe it will gratify him that you should know that, during the whole of these years he has ever acted in the most complete harmony, not only with the Board collectively, but with every individual member of it. No body of men ever had an Adviser more capable, more courteous, or more considerate than he. I am glad it has fallen to my lot to acknowledge the great services he has rendered the Company. You, ladies and gentlemen, and we, will regret his retirement; but you will, I am sure, agree with me that the services he has rendered, the eminent position he holds in the engineering world, and I must say (though, perhaps, as you look at Mr. Jones you will laugh at me) the age he has attained, made it imperative that we should acquiesce in his desire to be relieved of the burden he has borne so long and well. You will, I know, wish that the Board should make suitable provision for his retirement; and we have already anticipated your wishes in this respect. I am glad to say we shall not lose his services entirely; for at the beginning of the New Year he will join the Board, and occupy the seat rendered vacant by the death of Mr. Besley. We were quite unanimous in deciding that the vacancy caused by Mr. Jones's retirement from the position of Chief Engineer should be filled by the appointment of his son—Mr. Stanley Jones. He has been in the service of the Company now for some years. He has had sole control of the Wapping station; and, in addition, he has taken the management and supervision of our shipping. I owe it to him to say that the successful result of the experiment in carrying coal direct to Poplar is due, in large measure, to his energy and skill. We have watched his work closely, and we all think highly of his ability, judgment, and perseverance, I have no doubt whatever that he will be a worthy successor to Mr. Henry Jones, as Mr. Henry Jones was, in his turn, to his late father, Mr. Robert Jones. You may rest assured that he will do well. Of course, you will understand that the new Chief Engineer will have the guidance and experience of his father for some years to come, should he feel it necessary to call for it. In conclusion, let me say that the current half year is the last under the old conditions. In the New Year, we begin under the new circumstances; but I have no doubt, at our next meeting, we shall be able to present to you as good an account as we do to-day. Unless unforeseen difficulties crop up, I see nothing to prevent the Commercial Gas Company continuing its prosperous and successful career.

The Deputy-Chairman (Mr. Walter Hunter) seconded the motion, remarking that he cordially agreed with everything the Chairman had said, and especially with the words in which he had referred to his old friend the Engineer, whom they all respected, were indebted to so much, and to whose guidance the Company owed such a large measure of its prosperity.

Mr. S. M. Wood asked whether, after conversion, the proposed 4 per cent. stock would have priority as to dividend over the new 3½ per cent. stock. He also contended that the 7 per cent. stockholders were going to be sacrificed. It was proposed to convert each £100 of the 4½ per cent. debenture stock into £150 of 3 per cent. debenture stock; and there was some question as to the redemption of this debenture stock. It might happen, for some reason or other, that they would have to repay it. The Company might amalgamate or be bought out; and then the holders of these debentures would get £150. He admitted in some cases they had paid a premium of £30; but in many cases the debentures were allotted at par. What he wanted to know was, if they had to repay them at £150, out of whose pocket that was to come. Another point he might mention was this, that at present when there was a surplus, it was divided equally between the 10 per cent. holders and the 7 per cent. It was now proposed to convert every £100 of old stock into £250 of 4 per cent. stock; but the holders of the 7 per cent. stock would only get £200. Therefore, after 4 per cent. was paid on the £250 and 3½ per cent. on the £200, if there was a surplus, the holders of the 4 per cent. stock would get their share on the £250, while the 3½ per cent. holders would only get it on £200. Then, supposing the Company were bought out, they would have to pay the debenture holders a premium of £150,000—that was to say, 50 per cent. on £300,000—and in the case of the holders of the old stock, they would have to pay them a premium of £275,000—making together £425,000, which would really come out of the pockets of the 7 per cent. holders.

The Chairman said he could assure Mr. Wood that the interests of all parties were not changed one whit. He had asked whether the 4 per cent. stock would have priority over the 3½ per cent. The answer to this was that, under the Act of 1847, a small part of the capital was preference, but preference only as to dividend, not as to capital, and only to the extent of 5 per cent. per annum. That was to say, this small amount of capital (which was raised when the Company was in low water) was entitled to receive 5 per cent. before anybody else had anything. In the 1875 Act, there was a clause which preserved the right of these preference holders. It had been repeated in the new Act; and this was the only priority that any holder of stock had over any other. Under the conversion, the preference holders, instead of being entitled to 5 per cent. priority, would get a 2 per cent. priority. Under no circumstances was the debenture stock repayable; and therefore the ordinary shareholders would never have to repay it at a premium. The holders of the 3½ per cent. stock would not be sacrificed to the holders of the 4 per cent. stock. Their rights were exactly the same as before the Act passed; and the dividends would be paid in precisely the same ratio.

Mr. Newling: If this is merely a change in figures, what is the good of making the alteration.

The Chairman replied that the good was twofold. First, it made the nominal return on the stock more nearly equal to the dividend received. Secondly, it did not make so large a premium on the Stock Exchange; but the stock would really be worth more than it was before.

Mr. Newling: The conversion in the case of the Gaslight and Coke Company does not seem to have done so. (Laughter.)

The motion was unanimously carried.

Dividends at the rates of 12½ per cent. per annum on the old stock and 9½ per cent. on the new stock having been declared,

A hearty vote of thanks was passed to the Chairman and Directors, on the proposition of Mr. C. I. Thornton.

The Chairman, having responded, moved a vote of thanks to the chief officers, their staffs, and the workmen. He specially alluded to the services of Mr. Jones and Mr. Ellis, and complimented them on the Bill having passed through Parliament last session so successfully. As to the staff, he referred with satisfaction to the fact that the Company had a number of young men coming forward who were in every way admirable. In further remarks, he alluded with regret to the ill-health of the Accountant (Mr. W. Favatt), and said he was sure that the proprietors would join with the Directors in expressing their sympathy with the able Manager at Poplar (Mr. J. B. Kent), who was about to undergo an operation similar to that which the King underwent a short time ago.

The Deputy-Chairman seconded the motion, which was cordially agreed to.

Mr. Jones, in responding, said he had often intruded on the patience of the proprietors, but never perhaps under such feelings as he experienced on the present occasion, because this vote came after an explanation of a personal kind from the Chairman, the reception of which by the proprietors and their concurrence had moved him very deeply. Regarding the vote just passed, the Chairman had alluded to two members of the staff who were at present laid by; and he thought it was a proof of the loyalty and devotion of the staff that Mr. Favatt (who had been in the service of the Commercial Company for a period of fifty years) came out and drafted the accounts after December last when he ought to have been in bed. Mr. W. Cross, the Manager of the Stepney works, got about last winter for a whole month when he did not know how to keep on. Mr. Kent had unfortunately to undergo an operation. He had been on the works lately, but in such pain and suffering, that they had to urge him to go home. Those were the type of men they had in their service. He was also glad to say that they had springing up among them some smart and bright young men. The Americans said everything was to be done in the future by young men; and there was no doubt that much could be done by young men that old men could not do. He himself would now be glad of a rest; and he believed he was doing the proprietors a service in going away from the duties of an arduous office, and one that required the

energy and activity of a younger man, rather than keep on enjoying an income for which he personally could not do the service that he conscientiously felt it his duty to do. He looked forward to the future of the Company with great confidence. He would use his last breath and influence, so long as he had influence as a trained engineer, in forwarding the line that had been taken up by Sir George Livesey to make the manufacture of gas a good, wholesome, and commercial business, and not the mere fad of chemists, and microscopic examination. They found a large demand growing up for gas for power and fuel purposes, for which people did not want any great refinement. They must work to get rid of the academic, microscopic, and ridiculous treatment that they now had. They had a good leader; and gas men had begun to realize that they must clear themselves of all this bureaucratic business.

Mr. ELLIS also acknowledged the vote, and asked to be allowed to say, in reference to Mr. Wood's remarks, that the equality between the old and new stocks had been absolutely preserved. There was an apparent discrepancy, because the new stock was multiplied by 2, and the old stock by $2\frac{1}{2}$; but that was corrected by the sliding-scale.

This concluded the long but interesting proceedings.

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

The Half-Yearly Meeting of this Company was held last Tuesday, at the Offices, D'Olier Street, Dublin, under the presidency of Mr. CHARLES LAWLER, J.P., the Chairman.

The SECRETARY (Mr. Francis T. Cotton) having read the notice convening the meeting,

The CHAIRMAN moved the adoption of the report and accounts, particulars from which were given in last week's "JOURNAL," p. 888. He said that during the six months under review they had sold 670,504,108 cubic feet of gas, which was 16,767,486 cubic feet more than in the corresponding period of last year. For gas they received £127,799, which was less by £3467 than in the previous year. This was caused by the reduction in price of 3d. per 1000 cubic feet, which amounted to over £7000. The reduction took place from the December quarter. There was a considerable falling off in the price of residuals. For coke, they received £14,910, which was a decrease of £4736 compared with the corresponding period, though they sold a much larger quantity. For breeze, they received £1053, which was a decrease of £73; and for tar, £2527, or a decrease of £1000. The amount we received for sulphate of ammonia was £2453, a decrease of £515. The total decrease in the receipts from residuals was £6325. There was an increase in automatic meters of 1987; the number now in use being 11,915. The amount of money received for gas passing through automatic meters for the half year ending June, 1901, was £8936; while for the six months ending June last it was £11,627, or an increase of £2691. The demand for these meters still continued. During the same period, they supplied and fitted up 1657 additional cookers. Notwithstanding the serious decrease in the prices of residuals, the Board had decided to further reduce the price of gas 3d. per 1000 cubic feet, this reduction to take place from the December quarter.

Mr. MAURICE BROOKS, D.L., seconded the resolution, which was passed unanimously.

The CHAIRMAN moved that dividends be declared at the rate of $10\frac{1}{2}$ per cent. per annum on the old shares, and $7\frac{1}{2}$ per cent. per annum on the new shares.

Mr. H. J. GILL, J.P., seconded the motion, which was carried.

The CHAIRMAN said that the shareholders would remember that at their last meeting a resolution was passed increasing the salary of the Secretary. This resolution required confirmation at the present meeting, and he accordingly moved that it be confirmed.

Mr. JOHN MURPHY seconded the proposition; and it was agreed to.

The CHAIRMAN said they would now hold an extraordinary general meeting, in order to pass a resolution ratifying the issue of £10,000 of ordinary 7 per cent. capital. This resolution, he said, was one which required some explanation. The issue of stock or share capital needed confirmation by the shareholders at a general meeting called for the purpose. In 1883, the Directors were empowered to raise from time to time the whole of the debenture stock of the Company; and at about the same date they were authorized to issue and raise £100,000 of 7 per cent. share capital. The Directors exercised the latter power to the extent of £50,000 immediately after, and so matters remained up to October last, when they found it necessary, in consequence of the large increase in the business, to raise additional capital. This they decided to do by the issue of £60,000 of 7 per cent. share capital, which sum was £10,000 in excess of the balance of the £100,000 for which they had sanction. The Directors, in issuing the share capital, inadvertently overlooked the fact that the resolution authorizing it limited the amount to £100,000. Hence it was necessary to ratify by resolution the issue of £10,000 in excess of the amount originally authorized. He therefore moved that this be done.

Mr. JOHN L. SCALLAN seconded the resolution, which was passed.

The CHAIRMAN said there was now a resolution authorizing the raising of further additional 7 per cent. capital to the amount of £100,000. It would be necessary to do this, because the business of the Company in course of time would want this amount of money. Though they proposed to take power now to raise £100,000, they were not going to issue it until they actually required it. He moved that the Directors be empowered to raise from time to time further additional 7 per cent. capital, as required, to the amount of £100,000.

Mr. HAMILTON DRUMMOND seconded the resolution, which was passed.

The proceedings concluded with votes of thanks to the Chairman, Directors, and officers of the Company.

The Local Government Board have given their sanction to the application by the Milton-next-Sittingbourne Urban District Council for power to borrow £12,000 for works of water supply. The scheme will be put in hand at once.

EDINBURGH AND LEITH GAS COMMISSION.

Reduction in the Price of Gas.

At a Meeting of the Edinburgh and Leith Gas Commission on Monday last week—Mr. D. PURVES, Convener of the Works Committee, presiding—the principal business was the fixing of the price of gas for the year from the October survey.

The Treasurer (Mr. John S. Gibb) had prepared an estimate of the revenue and expenditure for the current year to May 15, 1903, based on the actual figures for the past year. In a circular accompanying his statement, he said that in determining the estimate he had had the benefit of the aid and experience of the Chief Engineer (Mr. W. R. Herring, M.Inst.C.E.), who had carefully examined and approved the items belonging specially to his own department—viz., the expenditure for manufacture and distribution, and the income from the sale of gas and residual products. The probable income from the sale of gas was arrived at by the Engineer by taking the estimated quantity of gas sold up to the 15th of October at 3s. 4d. per 1000 cubic feet (the present price), the gas sold through prepayment meters and for the public lamps and stair lights at their proper rates, and the gas sold to the outside districts at the current rate of 3s. 4d.; but the gas supplied within Edinburgh and Leith after the 15th of October at 3s.—a reduction of 4d. per 1000 cubic feet. The Treasurer's estimate for the sinking funds proceeded on the basis of the minimum statutory allowances of 15s. and 20s. per cent. being set apart for those funds without suspension of the rate for the Granton works, which might not be available at Whit-Sunday, 1903. One penny per 1000 cubic feet on the year's estimated income represented £7545. The estimated probable deficiency on the year's working was £8451; but that might be lessened somewhat by economies realized through the new works at Granton.

The estimate of the quantity of gas was based on an increase of 3 per cent. (equal to 52,741,000 cubic feet) upon the quantity sold in the year to May 15, 1902; making 1,810,782,000 cubic feet. The revenue from the sale of this quantity of gas is estimated at £277,909, made up of £247,520 from ordinary consumers, £3367 from consumers with prepayment meters (who are charged at the rate of 4s. 2d. per 1000 cubic feet), £11,937 from public lamps (2s. 8d. per 1000 cubic feet), £9829 from stair lights (2s. 8d.), and £5257 from outside districts (3s. 4d.). Last year the total revenue from gas was £291,164. The income from the sale of coke is estimated at £11,550, compared with £11,714 received last year; from tar at £11,630, compared with £12,927; from sulphate of ammonia at £11,985, against £11,061; and from other sources £720, compared with £671. The total revenue is estimated at £313,794.

On the expenditure side, it is assumed that 170,994 tons of coal, costing £106,871, will be required, compared with 166,014 tons, at a cost of £117,783, which were carbonized in the past year; that 3500 tons of gas oil, costing £6825, will be required, compared with 3419 tons, costing £15,161; that purifying materials, oil, water, and sundries, will cost £10,200, against £9766; that salaries, wages, and charges at works will come to £52,000, compared with £50,871; and the repairs of works and plant will cost £12,000, compared with £10,145. The total estimate for the manufacture of gas is £187,896, against an actual cost last year of £203,727. The distribution of gas is estimated to cost £28,300, compared with £27,195; management, £10,400, against £10,001; feu duties, £300, against £289; rates and taxes, £12,000, against £7352; pensions and allowances, £800, against £998; law and conveyancing expenses, £600, against £574; accidental damages, £50, against £7; discounts, abatements, and bad debts, £6800, against £6727; annuities, £33,400, against £33,458; interest, £24,300, against £22,777; expenses of mortgage, £700, against £903; annuities sinking fund, £8800, against £8848; mortgage sinking fund, £7700, against £3933; and a minimum contribution of $\frac{1}{4}$ per cent. on £80,000 to reserve (a new item), £200. The total expenditure is thus estimated at £322,246, compared with £326,789, and, as already stated, is £8451 more than the estimated income.

The Commissioners adopted the estimates of the Treasurer, and recommended in terms of his proposals as to the price of gas.

The CHAIRMAN, in moving this recommendation, said that, after very careful consideration, the Committee had resolved to reduce the price of gas from 3s. 4d. to 3s. to ordinary consumers in Edinburgh and Leith. There were special rates to other consumers, under agreement. The Committee had had no difficulty in coming to their decision, because the figures they had before them quite justified them in making the reduction.

Mr. J. M. MANCLARK seconded the motion. He said that although there was an anticipated deficiency of about £8000, he thought they were justified in making the reduction, in view of the statement before them, and of the full manner in which everything had been provided for in the estimates. It was anticipated that the cheaper production of gas at Granton would turn the estimated deficiency into a profit at the end of the year. There was no need for the Commission to have a profit—in fact, it was a bad thing for them to have one, because last year they had to pay rates and taxes on a profit of £11,000. He hoped that next year they would have a balance on the right side, and he had no doubt they would.

Mr. J. JAMIESON thought the Commissioners were in a most satisfactory position, as were also the public. When they found that, simultaneously with the equipment of large new gas-works they were able to recommend a reduction of 4d. per 1000 cubic feet in the price of gas, they must conclude either that they had a very well-conducted undertaking, or that there was otherwise a most favourable state of affairs.

Bailie SMITH referred to the sale of electric current at a reduced rate for motive power, and said he thought it was a question whether the Commissioners should not follow this policy and supply gas for motive power at a cheaper rate.

The CHAIRMAN said they had authority to do so, and the matter was being gone into carefully. They were now in the position of being able to supply an increased quantity of gas, but up to the present time it had been very tight work for them.

The recommendation was agreed to.

MANAGEMENT OF THE NOTTINGHAM GAS UNDERTAKING.

At the last Meeting of the Nottingham City Council, the proceedings at which were reported in the "JOURNAL" for the 16th ult. (p. 759), Alderman Radford made some remarks which were not favourable to the management of the gas undertaking, comparisons being made by him of the working at Nottingham and the results achieved by the Sheffield Gas Company. The Gas Committee have therefore thought it their duty to prepare a report on the statements made by Alderman Radford; and this report was to be considered at the meeting of the Council held yesterday (Monday).

The Committee preface their observations by the remark that the statements referred to were made without notice, and without an opportunity being afforded to the Chairman to reply thereto. The burden of Alderman Radford's observations, they point out, consisted in the comparison of the price of gas at Sheffield and at Nottingham, and that the Sheffield Company were now supplying gas at 10d. per 1000 cubic feet less than the Corporation of Nottingham. On these points, they say, it is difficult to compare the two undertakings, inasmuch as their accounts are not made up at the same period of the year, and there are special circumstances in each not common to both. In the case of Sheffield, the accounts are made up in June and December; while the Nottingham accounts are made up to March 31. Taking the Sheffield accounts from June, 1901, to June, 1902, the figures show that the price paid for coal was 9s. 11·21d.; whereas the price paid by the Nottingham Corporation was 12s. 10·64d., or 2s. 11d. more. This difference amounts to above 3¾d. per 1000 feet of gas sold. Sheffield, as a Company, is under no liability to redeem its capital; whereas the Corporation of Nottingham are obliged to establish a sinking fund for the extinguishment of their consolidated stock and for the repayment of loans and debentures. On this account, the Corporation of Nottingham paid during the year in question a sum of £4305, or rather more than a ¾d. per 1000 feet of gas sold. The Sheffield Company made no contribution in aid of the rates of the Local Authority; whereas the Nottingham Gas Committee hand over to the Finance Committee in reduction of the rates of the city a sum of £24,516. This would be equal to 3¾d. per 1000 feet of gas sold. Again, the illuminating power of the Nottingham gas, as shown in "Field's Analysis" for 1901, is 18½ sperm candles; while Sheffield gas is only 17·34 candles. This, taken at the recognized valuation of 1d. per 1000 cubic feet, would amount to more than 1d. for every 1000 feet of gas sold. The district supplied by Nottingham extends over the large area of 133 square miles. A very large proportion of the mains have been laid in country districts and are comparatively unremunerative, and subject to constant breakage and leakage through mining operations. The Sheffield Company have a much more compact district; and they are not liable to the same waste as Nottingham. There is a difference against Nottingham in this respect. Further, it must be noticed that the gas manufactured by the Sheffield Company is about 50 per cent. more than that manufactured by Nottingham. This gives a great advantage to Sheffield. Then, again, the wages paid by the Nottingham Corporation to their workmen are rather more than those paid by the Sheffield Company. These last mentioned items will fully account for another ¾d. per 1000 cubic feet sold. If all these differences are added together, they amount to the sum of 9d. per 1000 feet. Moreover, the Sheffield Company carry on an extensive business in plumbing work and fittings. There are other circumstances connected with the supply of gas in Nottingham which make it more difficult for the Corporation to compete with such a place as Sheffield—for instance, the disposal of gas residuals. It is evident that Sheffield has a far better local market for coke than Nottingham. Nottingham is obliged to seek for its customers at a great distance. The Committee believe that, in these remarks, they have shown enough to convince any unprejudiced person that, under the circumstances, the manufacture of gas and residuals by the Corporation of Nottingham is as economically conducted as by the Sheffield Gas Company.

The next matter to which Alderman Radford referred, and which seems to the Committee to demand some observations, was the purchase of coal. Alderman Radford called attention to a statement in the Committee's report, presented to the Council at their last meeting, that the decrease in the cost of coal in the Nottingham undertaking had been £6514, and that there had been a very much larger decrease in Sheffield. He stated "that the discrepancy was so enormous that they could only suppose that there had been a want of capacity in placing the contracts so far as Nottingham was concerned." The method of obtaining coal by the Committee is as follows: Tenders are invited by advertisement for the supply of coal for twelve months. The tenders received last June amounted to 48. These came from all the principal coalowners of the Yorkshire, Derbyshire and Nottingham districts. The tenders were opened by the Committee and carefully analyzed. The Committee had furnished to them a report of the value for gas-manufacturing purposes of the different kinds of coal; and, under advice, they accepted seventeen tenders for 169,500 tons, this being the amount which, in the opinion of the Committee, it was necessary should be immediately secured for the ensuing twelve months. The tender accepted in every case was the lowest in view of the economic production of gas and residuals. The Committee believe that this is a plain, straightforward, businesslike way of purchasing coal. It is, they add, scarcely necessary to say that no member of the Gas Committee has an interest in any of the firms supplying the coal. The Sheffield Company are in a favourable position for their coal supplies; their works being in close proximity to the Yorkshire gas-coal fields. It is estimated that the cost of carriage of coal to Nottingham amounts to as much as 2s. 1d. per ton extra for all coal obtained from the Yorkshire coalfields. This affects about two-thirds of the total quantity of coal carbonized by the Nottingham Corporation. It is evident that the Corporation of Nottingham cannot be expected to compete with Sheffield in the price of coal for gas purposes.

The Committee remark that it is almost impossible to make any comparison between the capital employed by the Sheffield Company and the Nottingham Corporation. The Sheffield capital amounts to £918,482; whereas the capital employed by Nottingham is £1,119,333—valuing the annuities at £50 each, which was the nominal value when the undertaking was purchased by the Corporation. No doubt the manufacture of gas in Nottingham is handicapped by unproductive capital. This unproductive capital consists of a large sum of money which the Company nominally raised when they converted their 10 per cent. stock into 5 per cent. stock, and also of the premiums paid by the Corporation for the purchase of the undertaking. It is therefore evident that Nottingham and Sheffield are not comparable in this respect. The following observations, however, may, the Committee say, be made: The Sheffield Corporation pay the sum of £87,905 annual interest on the capital they employ. They sell 2,753,288,900 cubic feet of gas. It is fair to suppose that if they had to produce only the amount of gas sold in Nottingham—viz., 1,798,779,300 cubic feet—they would have to employ proportionately less capital, and would have to pay a proportionately less sum for dividend and interest. This would be about two-thirds of what they are now actually paying, or a sum of £58,000 a year. In Nottingham, the annual charge for capital in respect of gas sold amounts to £46,584, including therein the sum of £21,070 paid for annuities. This leaves a balance of £12,020 against Nottingham to be accounted for. This balance disappears when the following facts are considered. Throughout the whole of the Nottingham financial year in question, the cost of coal was not practically affected by the reduction in price; whereas for three months of the year in question of the Sheffield Company the expenditure was at the lower price which was then ruling the market. From a careful calculation made by Mr. Garton, the Chief Accountant, it appears that this difference amounts to £9500, in addition to the sum of £6514 mentioned in the Gas Committee's report. Then, again, there was paid out of revenue (not out of capital) on account of extraordinary expenditure for tramway purposes a sum of about £4000. These considerations show that Nottingham is not in a worse position than Sheffield in this respect, when proper explanations are afforded. The Committee therefore trust that the Council, on considering the observations contained in this report, will be satisfied that there is no sufficient foundation for the grave charges made against the management of the gas undertaking by Alderman Radford.

In connection with this statement by the Committee, special interest attaches to the report of Mr. Mark Mellors, the City Auditor, on the accounts of the gas undertaking. The principal portions of this report, which was also to be considered yesterday, are as follows: The capital account, which was increased by £45,000 in 1901, has again been enhanced by £25,000, and now amounts to £1,119,333 9s. 4d. There has been no corresponding expansion in the revenue income; and the profits have consequently had to bear a heavier burden of interest. The charges for interest, &c., are: 1901, £44,919 6s. 2d.; 1902, £46,584 13s. 4d.—representing an increase of £1665 7s. 2d. The additional charge is in part attributable to the disturbance of the roadways for tramways. I find in the books entries on tramways account amounting to £25,246 7s. 3d. But of this, only £5928 5s. 10d. appears to the debit of the tramways account; £19,318 1s. 5d. being relegated to the capital account of the Gas Department. I know it can be said with truth that the plant of the gas concern has been thereby improved. Nevertheless, that improvement was only necessitated at this time by the works for the tramways. Had the gas concern been a private company, the tramways undertaking would have been compelled to bear nearly the whole of the cost. As compared with the previous year, there has been an increase by the sale of gas of £8094 5s. 3d., and by sundries of £6460 10s. 11d.—a total of £14,554 16s. 2d. On the other hand, there has been a decrease by the sale of residual products of £14,693 16s. 6d., occasioned by the fall in the market value. This leads me to refer you to my last report, in which these words occur: 'On examination of the stock-books . . . I found the stock of coals, coke, and breeze valued at £19,042 9s. 9d., as against £5808 15s. last year. This difference will not be beneficial to the accounts of the department in a falling market.' The present balance-sheet fully justifies those remarks. The cost of coal for 1901 was £133,242 12s. 2d., and for 1902 £126,728 12s. 5d.—being a decrease of £6513 19s. 9d. The cost of manufacture and management has not been appreciably altered; but there has been a large increase in the outlay on repairs, maintenance, and renewal of mains and service-pipes, £3682 4s. 11d.; stoves, £2121 14s. 4d.; and rates and taxes, £1355 6s. 6d. The bad debts amount to £391 9s. 5d., as against £512 13s. 10d. After careful consideration of the divergencies to which I have pointed, there can be no wonder that the net profit on the year's transactions was only £24,516 9s. 11d., as against £27,123 10s. 7d. in 1901."

TODMORDEN GAS PROFITS.

Question of Income-Tax.

At the last meeting of the Todmorden Town Council, on the Gas Committee's minutes coming up for consideration, Mr. John Dugdale said he found from the annual report as to the gas-works that there was a net profit of £1959 as a result of the year's working. The income-tax which would have to be paid on this sum would be £120. He suggested that, instead of allowing the profit to go to revenue, they should reduce the price of gas to the extent of 3d. per 1000 cubic feet, and so let consumers in the town have the benefit. They could do this and likewise abolish meter and stove rents, and still have a balance in hand. This would please everybody except the Manager, who naturally wanted to show a substantial profit; but this point might be met by granting that official an increase of salary. Alderman Jackson, the Chairman of the Gas Committee, in reply, observed that on a former occasion he had had a lively experience as a result of reducing the price of gas before such a course was warranted; and he did not want the Council to fall into an error of the same kind again. To have made a profit during a period when so many gas companies and corporations

had suffered in this department, was, of course, satisfactory. Still, their account was overdrawn at the bank; and it was highly desirable that they should have sufficient working capital. It was not probable that what Mr. Dugdale had suggested would in the least affect what they would have to pay in the way of income-tax. He was quite in favour of cheap gas; and the price would assuredly be lowered as soon as it was wise to do it. The Committee's minutes were adopted.

THE LONDON COUNTY COUNCIL AND GAS TESTING.

Gas Testing on Sundays and Bank Holidays.

The *agenda* for the meeting of the London County Council to-day contains the following report on the above subject by the Public Control Committee:—

Our attention has been called to the desirableness of testing the gas supplied by the three principal Gas Companies on Sundays, in consequence of a case which has arisen in connection with the gas supplied by the Commercial Gas Company. The Gas Examiner at the Parnell Road testing-place reported that the gas supplied by the Company on Friday, the 21st, Saturday, the 22nd, and Monday, the 24th of March, 1902, contained an average on the three days of 22·83 grains of sulphur. The winter notification of the Gas Referees provides that if at any testing-place on any one day there is an excess of sulphur beyond 22 grains, then the average of the testings on that day and on the *preceding* and on the *following* day shall be deemed to represent the purity of such gas on such one day at such testing-place. The Commercial Gas Company have raised the point that the tests referred to were not made on successive days, and that therefore no proper average, within the meaning of the Act, had been arrived at. We are advised that there is power under the Gas Acts for the Council to test the gas on Sundays. If testings are not made on Sundays, the tests for Saturday and Monday will, if the contention of the Commercial Gas Company were upheld, be practically useless as regards the purity of the gas in cases where the Companies are entitled to have an average struck; and we are therefore of opinion that testings should be made on Sundays and bank holidays. The cost of testing the gas on Sundays and bank holidays at the twenty gas-testing places under the control of the Council, if Relieving Gas Examiners are paid at the ordinary rate—viz., 10s. per day—will amount to about £600 per annum; and we propose that the tests should be made for six months, at the end of which period we will report further. There will probably be sufficient provision in the estimates to meet the expenditure which will be incurred up to March 31, 1903. We recommend—"That the Public Control Committee be authorized to arrange for the gas supplied by the Gaslight and Coke Company, South Metropolitan Gas Company, and Commercial Gas Company to be tested on Sundays and bank holidays by Relieving Gas Examiners at the prescribed testing-places for a period of six months, at a cost not exceeding £300."

DUNDEE CORPORATION GAS UNDERTAKING.

Appointment of Manager.

A Special Meeting of the Dundee Town Council was held last Tuesday to further consider as to the filling up of the post of Manager of the Corporation gas undertaking, which was vacated in June last by the resignation of Mr. W. M'Crae. Lord Provost Hunter presided. There were 35 applicants for the position; but a short list of five was made up, and only these were submitted to the meeting. They were: Messrs. A. Yuill (Alloa), J. Kincaid (Falkirk), W. Ewing (Greenock), S. Donald (Dundee), and W. B. M'Lusky (Perth). These gentlemen were present by invitation, and each was, in turn, interviewed by the Council. It is reported that "thereafter the merits of each were debated at length, and it was resolved to then and there make the election. The first vote, by which the list was reduced to three, was taken, and resulted as follows: Yuill, 8; Donald, 8; M'Lusky, 6; Ewing, 3; and Kincaid, 0. The second vote resulted as follows: Yuill, 11; Donald, 11; M'Lusky, 3. The final vote as between Messrs. Yuill and Donald resulted in the former receiving 17 votes and the latter 8. On the formal motion of the Lord Provost, the meeting unanimously appointed Mr. Yuill Gas Manager, his salary being fixed at £600 per annum—a condition of the appointment being that he should devote the whole of his time and attention to the duties of the office, and that any outside consultative work in which he might be called upon to engage should only be undertaken with the sanction of the Council. Mr. Yuill, called into the meeting, was informed of his appointment, and briefly returned thanks. Asked at what date he would be prepared to undertake his duties, Mr. Yuill indicated that he should prefer to consult with his Committee before making any promise on the subject."

THE POLYTECHNIC CLASSES IN "GAS MANUFACTURE."

Proposed Junior Gas Association for London.

At the re-opening of the classes on "Gas Manufacture" held at the Regent Street Polytechnic last Wednesday, Mr. Walter Grafton, F.C.S., who conducts them, distributed the medals and certificates of the successful candidates in the Institute's and City and Guilds examinations, lists of which have been published in the "JOURNAL." After the distribution, Mr. Grafton addressed the past and present students on a subject on which there has been no little correspondence—viz., the formation of a London Junior Association for those engaged in the gas industry, similar to the successful Junior Association at Manchester. He pointed out the advantages of such a society, and said the authorities at the Polytechnic had offered considerable aid. Asking those present if they were willing to become members, about thirty acquiesced. Many past members of the class had previously intimated their willingness to join. At the close of the meeting, a presentation, in the form of a "kit" bag, was made to Mr. Grafton by Mr. P. F. Scarth, on behalf of the members attending in the past session; remarking, in so doing, that it was "a slight recognition of the care Mr. Grafton had bestowed on the students to prepare them for the examination." He also thanked Mr. Madden for assisting Mr. Grafton at the close of the session. Mr. Grafton suitably replied. Mr. Randall (of Tottenham), who was present, made a happy speech to the students on the future of the gas industry, and encouraged them to work with scientific method if they desired to achieve success. His remarks were very heartily received. We are asked by Mr. Scarth to intimate that he will be pleased to receive, at the Polytechnic Institute, 309, Regent Street, W., communications from any young men who may be desirous of joining the Association.

THE PRICE OF GAS AT ROCHDALE.

At the Meeting of the Rochdale Town Council last Thursday, Mr. Sharp moved that the price of gas used for lighting be reduced from 3s. 2d. to 2s. 11d. per 1000 cubic feet; and for heating purposes from 2s. 3d. to 2s., and that gas used through coin meters be at the rate of 25 cubic feet per 1d. instead of 20 cubic feet. He remarked that it was unfair that gas consumers should pay excessive charges for gas in order to reduce the rates of those who did not use gas; and it was not a proper principle that only gas consumers should pay for the gas used for the lighting of the streets to the extent of £5000 per annum. The price of gas was advanced in 1900 on account of the higher price that had to be paid for coal. In 1899 the price of coal and benzol averaged 10s. 8d. per ton; in 1900, it was 11s. 10d.; in 1901, when the price of gas was advanced, the cost of coal was 15s. 11d. per ton; and it was reduced last year to 14s. 8d., which price operated until July of this year. By the contracts entered into for this year, the cost of fuel was 11s. 1d. per ton. Since 1901 the cost of coal had decreased by 4s. 10d. per ton, which would mean a saving of £13,400. A reduction of 3d. per 1000 cubic feet in the price of gas would affect the receipts to the extent of £5400 during the year; so that the Committee would still gain £8000 by the reduced price of coal. The gas profits were devoted to reducing the General Purposes Committee rate, and thus those who did not use gas in their premises were benefited considerably at the expense of the gas consumers. This was unfair, and it ought not to continue. In 1900, £13,000 of the gas profits went towards the reduction of the rates; £6000 was voted to the reserve fund; and public lighting cost something like £4500—so that there was a total profit of £23,500. Besides, £8838 was paid for interest and sinking fund, and £763 for income-tax. Last year the income-tax on the gas profits amounted to £1580. By accepting his proposition, the Gas Committee would save income-tax to the extent of £337. Mr. Fletcher having seconded the motion, Alderman Petrie remarked that the Gas Committee had always been in favour of cheap gas; but when eventualities arose—like the increase in the price of coal—they were bound to raise the price of their commodity. The only thing he complained about in the proposition was that Mr. Sharp was too hurried. If he would alter the resolution so that the reduction would come into force at the end of next March, he would be willing to fall in with nearly all the suggestions. When the price of coal went up 4s. 4d. per ton, the charge for gas was raised 3d. The increased price of coal affected the Committee to the extent of £12,000; so that really the advance in the price of gas ought to have been 6d. He therefore thought the price ought to remain as it was in order that the Committee might cover the loss sustained. Coal had not gone down to the original price. It was now 2s. per ton more than the price paid before the advance was made. As to the gas profits, they formed a ready and easy method of making an income. Some gentlemen wanted to make a strong point about the incidence of taxation, and held that the making of large profits on gas, which was called a tax, was felt by some people more than by others. If they changed the taxation from gas profits to the rates, it would only remove the grievance off the shoulders of one class, and put it upon others. He thought the argument about unfair taxation might be placed on one side as a sentimental grievance. There was further discussion, which ended in the motion being rejected by 21 votes to 13.

HALIFAX GAS-WORKS INVESTIGATION.

The Report of the Sub-Committee—Resolutions for Proposed Extensions Rescinded.

The minutes presented by the Gas Committee at the meeting of the Halifax Town Council last Wednesday contained the following resolution: "That, after the receipt by the Town Clerk of the Gas Manager's observations, a copy of such observations, together with a copy of the Sub-Committee's report and the Borough Accountant's statement of expenditure on capital account, be sent to each member of the Committee."

The motion for the adoption of the minutes having been moved and seconded,

Mr. BREARLEY said that some two months since he put a question regarding the report of the Sub-Committee who were inquiring into the affairs of the gas undertaking, and now he wished to put very definitely the inquiry, "What reasons are there for keeping the report in the background, and why cannot members of the Council be informed and have full particulars of the matter placed in their hands?" He strongly demurred, as a member of the Council, to having to take a partial report from the Press, and not be satisfied that it was the official report.

Mr. G. H. WADSWORTH, the Chairman of the Gas Committee, replied that personally he had nothing to keep back, and he believed in, and courted, the fullest inquiry. The desire of the Committee was to

fathom and go to the bottom of the whole matter, to see exactly where they stood. The "man in the street" had sometimes known more than the Committee—in some cases rightly; in others, not so. But when the Sub-Committee was appointed, it was with the determination that, if possible, the Council should be the first after the Committee to receive the report. But through "some dastardly act" the reports—two out of the three—had got into a local newspaper in an abridged form. He was glad other newspapers did not think proper to copy. Of the way and manner in which a copy of the report was got at, he would only say that, as far as he understood, there was a woman in it. The paper in question had succeeded in getting a lady to hand over the report in the absence of her husband. It was intended that the Council should be the first to receive it. The Committee had gone very carefully into the matter, and had been hard at work on it. The work that he himself had had to do had been such that he hoped no other member of the Council would have to pass through the same crisis. The Committee had had to ferret things out the best they could; and the framing of the report was not the work of one individual. They had all, more or less, been engaged in drawing it up; and it was signed by five out of the six members constituting the Sub-Committee. When the Gas Committee had the report before them, they discussed it not in a heated manner (as stated in the Press), but fairly, and there was not a drop of bad feeling. All the members were doing their best to get at the truth of the matter. Six members who were present voted for the findings of the report, and six against them. It was left to him to give a casting-vote; but he did not do so. He had voted for the report, and he did not want it said in Halifax that the report was carried by just the Chairman's casting vote. He therefore informed his colleagues that he was going away to recruit his health, and that, when he came back, he hoped they would be prepared to say the Committee's best policy was to accept the report. However, the report had not been adopted; and the Committee were exactly in the same position. He thought the best thing would be to decide there and then that a copy of the three reports should be sent to every member of the Council. So far as he was personally concerned, he had nothing to hide; and he quite agreed the ratepayers had a right to know the facts of the matter.

Mr. J. Brearley thereupon moved, as an amendment to the minute in question, that a copy of the reports, together with the Manager's observations, should be sent to each member of the Council.

This was agreed to.

Alderman Smith, said from the statement of the Chairman, there appeared to be something very serious in the Sub-Committee's report; and, if this was so, they had better wait until they had reconsidered it. He suggested that six independent members of the Council should be appointed to go over the report with the Committee, and see how they had arrived at their conclusions, and then, if they were all of opinion that those conclusions were correct, copies could be sent to the Council.

The suggestion was agreed to, and six members were appointed.

Moved by Mr. Wadsworth, and seconded by Mr. Fawcett, it was agreed—"That the following resolutions passed by the Gas-Works Committee, on Jan. 9 and 23, 1901, respectively, and confirmed by the Council on Feb. 6, 1901, be and the same are hereby rescinded: 'That tenders be invited for the supply of carburetters. That tenders be invited for the supply and erection of the second unit of the water-gas plant.'"

COAL CONTRACTS AND CANDLE POWER AT STOCKPORT.

On the minutes of the Gas Committee being submitted for approval at the meeting of the Stockport Town Council last Wednesday, Mr. Sharples said there was apparently a substantial reduction in the price of coal this year, and he thought it was only fair that the Committee should take into account this reduction with a view to lowering the price of gas. The public were now paying a very high price indeed—2s. 9d. per 1000 cubic feet. But what he particularly wanted to draw attention to was the abstract way in which the coal tenders were recorded on the minutes. There was not a single contractor named nor were the Council in possession of the various prices of the coal. If the Council had a right to know anything, they had a right to know what prices they paid, and with whom they contracted. It was unfair to the ratepayers for the Council to summarize these things in the way the Gas Committee did. A year ago they got a report from the Gas Committee stating that they had paid an increased price of 4s. 3d. per ton; but that did not place the Council in possession of the facts. Mr. Rowbotham suggested to the Chairman of the Gas Committee that there was at least one class of gas consumers who deserved consideration in regard to giving preferential rates; he referred to those using gas for power purposes. Mr. M'Gregor referred to the intimation contained in the minutes to the effect that the Engineer reported having been unable to complete the main to the Reddish district. He would like to say that there was a great amount of discontent in Reddish with regard to both quantity and quality of the gas supply. The Mayor pointed out that it was the intention to put a new main down; but this had not been completed yet on account of the widening of Reddish Road. The shortage was entirely due to the district not having sufficient capacity of main. Mr. M'Gregor said he wished to complain further of the quality of the gas supplied to Reddish. On the minutes a considerable decrease in the consumption of gas was reported; and he ventured to assert that in a great measure this was due to a number of people finding that they had to discontinue burning gas. The quality at the present time, not only for Reddish, but, he believed, in various parts of the borough, was very poor and unsatisfactory. He thought it was high time it was improved. Up to a few months ago, they were burning in certain portions of Reddish the Manchester gas, and there was no comparison whatever between the quality of the gas supplied by Manchester, and that supplied by Stockport. The latter was much poorer; but he thought Stockport ought to be able to make equally as good gas as Manchester. Mr. Aldred said he should like to ask the Chairman of the Gas Committee how it was that these complaints continually arose month after month, when at the Gas Committee the standard of the gas was reported at each meeting to be 18-candle power. Mr. Webb, the Chairman of the Gas Committee, did not answer the question of Mr. Aldred; but replying to the others said that, as to the lower prices of coal, and the suggested reduction in the charge for gas in consequence, such reduction did not depend on the price of coal alone, but also on the price obtained from residuals. The latter last year more than wiped out the advantage gained. As to the abstract way in which the prices of coal contracts were given, the Committee thought it was to the interest of the Corporation that the prices which were paid to individual contractors should not appear, because the Committee thought they obtained better terms from contractors if the prices were not published. If the prices appeared, the information would go all over the town and give the Committee a great deal of trouble; whereas at present they got an advantage, sometimes of 2d. or 3d. per ton. In reference to Mr. Rowbotham's suggestion for preferential rates, it had been under the consideration of the Committee; and it was likely they would make a lower rate for power and industrial purposes when an even quantity was used all the year around. As to the quantity of gas supplied to Reddish, the Mayor had sufficiently answered that. It was not a criterion to compare the quantity of gas consumed in a fortnight with a similar period. The proper way was to compare a quarter's consumption with the corresponding quarter of a previous year; and they would then find there was a general increase. As regarded the quality of the gas, he believed the principal reason for any complaint in the Reddish district was through the want of pressure; and when they were able to get the new main connected, he did not think there would be such complaints. The quality of the Stockport gas was, he believed, fairly equal to that of Manchester, though he did not know exactly of what candle power Manchester gas was. The minutes were adopted.

MANCHESTER CORPORATION GAS AND ELECTRICITY SUPPLIES.

At the Monthly Meeting of the Manchester City Council, held on Wednesday last, the minutes of the Gas Committee were adopted without amendment. These included a resolution of the Street Mains and Lighting Sub-Committee, approved by the Committee, to the effect that Mr. Waddington, in consultation with the Engineer (Mr. J. G. Newbigging) should be instructed to extend the system of incandescent lighting, and substitute incandescent light for the flat-flame burners as opportunity arose, and where it might be considered desirable, subject to the approval of the Gas Committee on the recommendation of the Sub-Committee. The Sub-Committee have also been requested to consider the advisability of lighting Albert Square and around the Town Hall with intensified gas, and report to the Committee thereon.

The minutes of the Electricity Committee, the adoption of which was moved by Mr. Hesketh, the Deputy-Chairman, included a proposal to fix arc lamps in Portland Street, Oxford Street, and Cheetham Hill Road, with a view of making certain experiments as to the best form of electric street lighting.

Alderman Gibson, the Chairman of the Gas Committee, moved, as an amendment, that the part of the proceedings relating to the fixing of arc lamps be referred back. Permission was asked, he said, to light certain streets by way of experiment; but they were not told how many lamps would be required, or how much would be added to the capital account of the Committee, which was already very large, by the putting up of these lamps. There were already 29 electric street-lamps in use which had cost £45 to put up; and for the year ended March 31, those lamps had cost £632, or about £22 each, for light, against £4 per lamp for gas, and, in his judgment, with the result that a worse light was given. There had also been a cost of £11 per lamp for maintenance, as against £1 for gas; but how this cost could have been incurred passed his comprehension. In his judgment, it was a wrong principle to sell anything for less than it cost. There might be some exception in the case of electricity; and a former Chairman of the Committee used to lay stress on what he called a day load. But this argument did not apply, to his mind, as regarded the lighting of streets at night. He objected to the Committee being granted the privilege of making these experiments when they did not say anything about what they were going to cost, and what addition it would make to their already large capital account, which stood quite as high as that of the gas undertaking, and was increasing rapidly, though they had only one-fifth of the business. How they were going to pay interest he did not know. Entering into a comparison between electricity and incandescent gas lighting, he said the Engineer at Liverpool stated that, estimating lamps fixed 50 yards apart, and with gas at 2s. 7½d. per 1000 cubic feet and electricity 2d. per unit, electricity cost £546 per mile and the double-burner incandescent gas-lamps £126 per mile. The electricity undertaking in Liverpool belonged to the Corporation; while the gas undertaking was in the hands of a Company. The Chairman of the Electricity Committee had stated that they had come to the conclusion not to further extend electric lighting in the streets of Liverpool, as the incandescent gas system was quite as good and much less costly. They were doing exactly the same thing at Sheffield; and the Chairman of the Electricity Committee in Bradford himself moved that, in view of the excellent results obtained by incandescent gas lighting, it was inadvisable to sanction the erection of additional arc lamps. Sir William Preece, referring to the lighting of Maidstone, said that the streets were so well lighted at so cheap a rate by the incandescent gas system, that he questioned very much the advisability of adopting the arc system. In Berlin and in Paris, the authorities were removing their arc lamps and replacing them with incandescent gas-lamps; and the Chief of the Electrical and Gas Lighting Department in Paris had testified to the superiority of the latter for street lighting, both in the matter of light given and cost. In their own city, they had in Whitworth Street and the corner of London Road a system of incandescent

gas lighting which was, he believed, among the best in the kingdom. This result was secured at a cost of 1¾d. per hour per lamp. On the other hand, let them take the electric lamps in Piccadilly. Why, they could not see them; and if they were turned out it made no difference. If, however, the gas-lamps were extinguished at night, there was the grossest darkness.

Mr. J. Harrop seconded the amendment.

Mr. J. R. Wilson thought it would be generally admitted that electric lighting in Manchester, so far as the streets were concerned, had been a "frost."

Mr. Plummer said he would suggest that the Committee might be allowed to experiment in one street only.

Alderman Southern said if it were true that the capital expenditure of the Electricity Department was as great as that of the Gas Department, while the turnover was only one-fifth, the matter had a very awkward and ominous appearance.

Alderman Gibson remarked that the revenue of the Electricity Department last year was £134,462, against £763,210 in the Gas Department; and the capital expenditures of the two departments were practically equal. The Electricity Committee were also committed to a further expenditure of £300,000.

Ultimately, Alderman Gibson's amendment was adopted by a large majority; and a proposal by Mr. Jones that the Committee be allowed to make experiments in Oxford Street, between St. Peter's Church and Owens College, was ruled out of order, though Alderman Gibson, in order to show that he had no bias, expressed his willingness that the Electricity Committee should be allowed to make any experiments they liked in a particular street, providing the Gas Committee were granted the same privilege in another, so that at the end of a year's trial it could be authoritatively declared which mode of lighting was the cheapest and best.

GAS, WATER, AND ELECTRICITY AT LEICESTER.

At the last Meeting of the Leicester Town Council, the Gas and Electric Lighting Committee reported that the accounts of the gas undertaking for the half year ending June 30 showed that the net profit, after paying interest on the capital of the undertaking, was £13,759. Out of this had been paid £5737, the half-year's amount of sinking fund, leaving a balance of £8022 to be applied at the end of the financial year (March 31 next) as the Council may direct. The accounts of the electric lighting undertaking showed that the result of the working of the department for the half year ending June 30 was a net profit, after paying interest on the capital, of £4563. Out of this had been paid £2545, the half-year's amount of sinking fund, leaving a balance of £2018. There being insufficient storage capacity for gas, the Engineer (Mr. Alfred Colson) has been instructed to prepare plans and specifications, and invite tenders for the supply and erection of a three-lift gasholder in the tank already provided at the Aylestone Road works, increasing the storage by 3 million cubic feet, and making a total of 10 millions. Eight tenders were received, and that of Messrs. Ashmore, Benson, Pease, and Co., of Stockton-on-Tees, at £23,266, was accepted. Mr. Edwards, in introducing the adoption of this report, pointed out that there was a clear balance from the gas undertaking of £8021 for the reduction of the rates. The Committee were pleased to say that the works were doing as well as similar departments of other towns. They had reached the high-water mark of efficiency; and the only difficulty was that they wanted more storing power, their present capacity not being sufficient for one day's consumption in winter. The good results achieved were due to the splendid staff, headed by Mr. Colson, and the fine set of workmen. Referring to the Electric Lighting Department, he pointed out that the Committee desired the balance of £2018 to be carried forward, because, though they had a splendid plant, they did not know how soon it would be rendered obsolete by the vast strides made in electrical science. They did not want the experience of some other towns, who paid their profits over to the rates, and afterwards had to make a call upon them. Mr. Bruce protested against the balance from the Electric Department being carried forward, saying that it represented something like a penny rate, and in the present state of the rates ought to be handed over. The report and recommendations were, however, adopted.

The Water Committee reported that the accounts of the department for the half year showed a net profit, after paying interest on the capital of the undertaking, of £10,378. Out of this sum had been paid £3301 to sinking fund, leaving a net balance of £7077. The Committee proposed at the end of the financial year to carry this balance to the credit of the special water fund which had been created under the authority of section 164 of the Derwent Valley Water Act; and they recommended the Council to approve this course. The report was adopted.

ELECTRIC LIGHTING NOTES.

New Electricity Works for Colne.

A new electricity generating station erected by the Colne Corporation, at a cost, including plant and street cables, of £25,000, was opened last Thursday week.

Poor Show at Luton.

By the casting vote of the Mayor, the Luton Corporation decided at a recent meeting to apply for powers to borrow £5000 to extend the electric light cables outside the compulsory area. It was pointed out that £27,000 had been spent on the undertaking, and that there were only 70 consumers. Alderman Warren said the Committee were disappointed with the amount of business done in the area, and thought it wise to go outside, as the proprietors of several works had promised to take current for power at 2d. per unit. Other members opposed spending more money on "a losing game," as the deficit on the first year's working was £1600.

Hackney's Opulence.

The Hackney Borough Council are making a great show of wealth in connection with their electric lighting undertaking. On Monday, Sept. 22, they opened offices which have cost them £6000, and from these the work of the electric lighting system and of the dust destructor will be directed and transacted. The total cost of the electric lighting plant and apparatus, dust destructor, and offices, is £285,367. Although the electric lighting works were only opened on Oct. 31 last year, already 118 miles of mains have been put down; while there are 625 consumers, and some 730 applications for power.

From Company to Local Authority.

It is understood that last week the Woolwich Town Council completed the purchase of the works and undertaking of the local Electric Lighting Company. In accordance with the contract already signed, the purchase price is £101,000. This sum will be sufficient to return to the shareholders considerably over £2 for each £1 share. Approval has been given by the Local Government Board to the proposal of the District Council of Gillingham, Kent, to borrow £52,000 for the purpose of purchasing the local Company's electricity works and for erecting new buildings and increasing the plant and machinery. The purchase price to be paid by the Council to the Company, as fixed by valuation, is £26,659. An Insurance Company have undertaken to advance the loan at 3¾ per cent.; the Council to pay the stamp duty and charges and expenses, at the rate of 5s. per cent.

Aston's Big Scheme.

The ceremony of laying the foundation stone of the large electrical power station which is being erected by the Aston District Council was performed last Tuesday afternoon by Mr. J. J. Gittings, the Chairman of the Tramways and Electric Light Committee, who gave an interesting account of the history of the undertaking. In 1898, the Council obtained powers to generate and supply electric energy for lighting; but these were not put into force until some time later. In 1900, they were granted authority to equip the tramways after purchase, and if thought fit to work them. The plant now being installed would be sufficient to supply current to the whole of the tramways throughout the district, and in addition would carry a maximum load of 40,000 lamps of 8-candle power. The apparatus would be of the latest type, and from the point of view of the cost of production would be the most economical in the Midlands. Cables were being laid for private house lighting, for street lighting, for the supply of power to works and private consumers, and for carrying current to the trams. There would be altogether over 12 miles of cables, which would serve for about 100 arc lamps in the principal streets, and electric lamps or motors, &c., equivalent to about 42,000 lamps of 8-candle power. The amount of the contracts up to the present was £63,000; and to complete the equipment a further £4000 would be required. In addition, there was the sum the Council would have to pay for the purchase of the tramways; so that altogether it would be seen that they were now committed to the expenditure of a very large amount. Practically it meant doubling the existing debt; but as this debt was extremely small, and the venture would, if not at first, in a year or so prove remunerative, the ratepayers need not look upon it with any misgiving. Aston now owed £104,000, which was as nearly as possible 26s. per head of the population; while the rateable value was £269,000. Therefore the debt was under 40 per cent. of the rateable value. As to the price to be charged, it had been decided to recommend the Council to adopt the lowest figure which had ever been charged in any town in the United Kingdom—namely, 1½d. per unit for 22 hours of the day. For the remaining two hours (between 6 and 8 p.m. in winter, and 7 and 9 p.m. in summer), the price would be 6d. per unit. At 1½d. per unit, it compared equally with gas at 9d. per 1000 cubic feet, which was only a third of the present price of gas in Aston. For small consumers, the Committee were considering whether some scheme of free wiring could not be adopted to help them to instal electric light much sooner than they probably would under existing circumstances.

Condemnation at Bexhill.

Bexhill-on-Sea has been laid out on the most modern lines, even to the inclusion of the fashionable municipal electricity works; but, at present at all events, it seems that this undertaking cannot be regarded as one of the attractions of the place. Evidently the lighting of the town is, to say the least, being carried out in a very indifferent manner, thus causing totally unnecessary inconvenience to those persons who are out of doors after dark. Under these circumstances, it is not surprising to find in the local newspaper letters of complaint on the subject, written both on behalf of the residents and the visitors. One of the former goes so far as to say that "it is somewhat difficult at a distance to distinguish between the light from the town glow lamps and the candle in the window of the inhabitant not using the new and costly illuminant;" while a communication which has appeared, signed "A Visitor" (and which shows distinct signs of having been written by someone who is thoroughly conversant with the questions raised), sums up the situation so well that it will bear reproduction in full: "In your issue of the 13th inst., you did me the honour to publish some comments of mine upon the glow-worm like effulgence which makes darkness visible in so many of the streets of Bexhill. In your last issue was sounded a note of warning against the possible dangers of municipal trading. The connection between these two subjects is sufficiently obvious. Here in Bexhill is a Local Authority trading in electricity for all it is worth—and more. Its anxiety for the success of its venture appears to have blinded it to the superiority of other illuminants, with the result that the hapless ratepayers have become involved in a maximum of expenditure for a minimum of efficiency. It is impossible to suppose that the present unsatisfactory system of lighting would have had the least chance of adoption had the Local Authority not been owners of the electric supply. So true are the lines from Burns—

> 'When *self* the wav'ring balance tends,
> 'Tis rarely right adjusted.'

These appear to be applicable to corporate bodies as to individuals;

but there are exceptions. At Liverpool, for instance, where the Corporation own the electric but not the gas works, 411 miles of the streets are lighted by gas (which the Corporation have to pay a local Company for), and only 3¾ miles by electricity; and the Chairman of the Lighting Committee is reported to have said recently: 'We have come to the conclusion not to further extend electric lighting in the streets of the city. We have discovered that the incandescent gas system is quite as good, while it costs much less than electricity does.' The sooner Bexhill follows the example of Liverpool, the better it will be for the pockets of the ratepayers and the reputation of the town." Apparently the authorities at Bexhill think that so long as the sea-front is brightly lighted, at an extravagant cost, nothing else matters much.

EAST LONDON WATER-WORKS COMPANY.

The Half-Yearly General Meeting of this Company was held at the Offices, St. Helen's Place, Bishopsgate Street, last Thursday—Colonel A. R. M. Lockwood, M.P., in the chair.

The Secretary (Mr. I. A. Crookenden) having read the notice convening the meeting, the report and accounts for the six months ending the 24th of June, the principal figures in which were given in the "Journal" last week, were presented.

The Chairman said he ventured to hope that the proprietors would agree with the Directors that, upon the whole, the report might be taken as fairly satisfactory. The increase in the water-rates—£7184—did not quite reach the amount of the increase of 1901 over 1900, which was £9685; but, as he had often said, they were to a very large extent a meter-service Company, and the demand for water for trade and parochial purposes varied occasionally very considerably, and it was in this branch of their business that the rate of increase had diminished. It did not mean that their residential supply was in any way lessened, for the increase of direct services proceeded upon the ordinary scale, although the number of new services was 3060 only, against 3594 for the corresponding period of 1901. This, however, was not by any means a real loss, inasmuch as, although the number of new services was less, the character of the houses connected was better. There was an increase of revenue from all sources of £6237, and a decrease in expenditure of £4184; so that, relatively, as far as the Company's normal trade was concerned, they were upwards of £10,000 to the good. The addition of about £1400 in the sums "written off," compared with the amount in the corresponding period of 1901, arose from one or two unusual causes, which he proceeded to explain. The pumping machinery, &c., had been maintained in good working order, and he might emphasize this with the assurance that the Directors had been extremely careful that the whole of the plant should be kept in its usual state of efficiency—thus guarding against the possibility of a misapprehension arising upon the eve of the Company's undertaking being transferred to another authority. It was well known that insinuations had been made, upon such transfers taking place in the past, that ordinary restitution had been neglected, and that profit on trading had been correspondingly increased. He was thankful to say that nothing of the kind could arise in the history of their Company. The plant and works were so sound and comprehensive as to be capable not only of carrying on their present business, but also of effectively meeting the claims of a very large future extension. The Directors hoped that both the new storage reservoirs would be completed before the end of the year. They looked forward with hope and expectation to this enormous storage being effectively and satisfactorily available for the demands of the ensuing season. The supplementary filters at the Hanworth pumping-station were a great success, and would add materially to the value of this Thames source of supply, which had proved, especially through the slight rainfalls of recent years, a most valuable auxiliary service. With reference to the present position of the water question in Parliament, as the proprietors were probably aware, the Bill introduced by the Government, to which he alluded when he addressed them on the 20th of March last, was referred to a Select Committee of the Houses of Lords and Commons, who met for the first time on the 14th of April. The Committee sat for 23 days, during which time counsel, solicitors, and officers had to be in close attendance. As he said at the last general meeting, there were many points of divergence in the measure, and some of the provisions were absolutely unworkable. The evidence and arguments for and against the various clauses were incessant and most harassing. As regarded the representation of the Borough Councils and District Councils, the original scheme, as contained in the Bill, stood, *plus* certain changes, which increased the number to 71. There was a great diversity of opinion as to the constitution of the Water Board—many objecting to so large a number, while others considered it necessary, having regard to the enormous area and responsibility involved. Attention, however, was more specifically directed to the clauses, the terms of which might operate adversely to the interests of the proprietors. There was a good deal of giving and taking on one side and the other; but the Directors thought, speaking broadly, that the proprietors' interests had been fairly well safeguarded. There were complications and contradictions in matters of detail, which were very subtle and potentially injurious, which had had to be very carefully watched and amended. Thus in the Bill before the Committee the transitory provisions for the Companies' accounts being closed and the affairs handed over on the "appointed day" were utterly impracticable and almost incomprehensible; but after negotiations and interviews with the promoters and discussion before the Committee, a sub-section 2 in clause 40, initiated by Mr. Crookenden, was passed, making it perfectly clear that the basis of settlement, so far as the revenue account was concerned, should be one of assets and liabilities on the "appointed day." For instance, if the "appointed day" had been June 24 last, the Company would have been entitled to claim from the buying authority £89,985, the sum appearing to the credit of dividend and interest account in the balance-sheet. There was some ambiguity in the provisions with respect to the payment by the Water Board of the costs and expenses of the arbitration, and the proceedings connected therewith, incurred by the Companies; and he had therefore put a notice on the paper making it quite clear that all such charges and expenses reasonably and properly incurred should be borne and paid by the Water Board. There was a further point which the Parliamentary members of the Board of the Company were endeavouring to maintain—namely, that the provisions in the Bill that "all charges, costs, and expenses preliminary to and incidental to the preparing, applying for, obtaining, and passing of the Act incurred by the Local Government Board shall be repaid to that body by the Water Board," should be extended and applicable to expenses similarly incurred by the Companies. There were two leading blots in the Bill, to which he could not refrain from alluding—first, that it did not adopt the Lands Clauses Act pure and simple; and, secondly, the maintenance of the objectionable provision of the "appointed day." Of course, these were antagonistic. The adoption of the Lands Clauses Act would have rendered unnecessary the "appointed day" provision. This was an entirely new departure, initiated by the London County Council, and based upon the egregious fallacy that the Companies would have so procrastinated and obstructed proceedings that an indefinite period might have been occupied before any agreement as to terms of transfer could be arrived at. But under the Lands Clauses Act the Arbitrators would have had power to remedy any such course as this, had it been indulged in. Further, there was every inducement for the Companies to settle the terms of transfer, when transfer had been determined upon, as quickly as possible; while as the provisions now stood, there was no obligation on the Water Board to conclude their part of the evidence before the Arbitrators within any given period, nor was there the slightest inducement for them to do so after the "appointed day," when they would be in possession of the Companies' properties and businesses. But there it was. The promoters refused to give way upon this point, and the "appointed day" was maintained, although it had been deferred to Dec. 31, 1903, with power to the Local Government Board to extend it further to not more than 18 months later. The working of this novel and complicated innovation would be a matter for time to develop. It was possible, though not very likely, he thought—that some amendments might be made before the Bill passed the two Houses in the autumn session. But the proprietors might rely on the careful observance of the Directors being applied in the future as in the past; and they ventured to hope and believe that justice would be done. The late *exposé* of municipal trading by the "Times" fully justified the position which the Directors had always maintained as regarded the acquisition and management by the London County Council of the Water Companies' undertakings; and he trusted that the whole question of municipal trading would be earnestly considered by those who paid the rates. As a corporate body, like the great Railway Companies, their Company had been heavily weighted by the burden of increased rates, in the spending of which they had no representation. In 1897, their rates amounted to £33,900, and in 1901 they were £44,173, equal to an increase of 30 per cent., although their business during the same period increased at the rate of 20 per cent. only. As he explained when he last met the proprietors, the Directors appealed against the assessments in eleven cases, and succeeded in obtaining a reduction in eight. This would help the Company a little; but still the assessment of public undertakings was on a most unsatisfactory basis—in fact, upon no logical basis at all. In the United Kingdom, the indebtedness of the municipalities was nearly half the National Debt. The political objects which, to his mind, were always in sight in municipal trading constituted a danger in English politics which should be constantly borne in mind. With the past vagaries of the West Ham Corporation he had, for many reasons, been fairly acquainted; and they had often increased the difficulty which the Company had had to contend with of obtaining honest work for fair wages. There was now a Conservative and Unionist Government in power, whom the country had placed there in the belief that, among other things, they would deal fairly with the great trading companies, who, in return for certain concessions, had spent large sums of money for the benefit of the public, and who, therefore, had a right to demand from the Government such a check upon the abuses he had mentioned as might prevent their repetition. He concluded by moving the adoption of the report and accounts, and the declaration of a dividend at the rate of 8 per cent. per annum, less income-tax, on the ordinary stock, for the half year ended Midsummer.

Mr. G. Banbury seconded the motion.

Mr. Brown (of Brighton) asked several questions as to the terms which the stockholders were to receive on the transfer of the undertaking.

The Chairman stated that he could not give any definite reply until the Arbitrators' decision had been arrived at. He had not said that the terms offered to them were fair, but that they were the best that could be got for the proprietors.

The motion was then put and carried.

The Chairman said the resolution he was about to propose was the unanimous recommendation of the Directors, and it was as follows: "That this meeting confirm the payment to the Secretary of the *honorarium* voted to him by the Directors on the 20th of March last for extra services, and approve the agreement of the 1st of May providing for his retirement as Secretary, and the payment to him of a pension." The *honorarium* was 2000 guineas, and the pension £1000 per annum, free of income-tax, and payable quarterly. He stated that the resolution had been drawn up by the Company's Solicitors, and was based upon the agreement which had been entered into with the Secretary for the payment of the *honorarium* and for his retiring with the pension proposed immediately before the "appointed day"—namely "immediately precedent to the Company's undertaking being transferred to the body or Water Board proposed to be constituted under the Bill," as set out in the Directors' resolution of the 20th of March. In their opinion, it was an unfair position for the chief officer of the Company to be placed in—namely, to be transferred to the new Water Board, and so become their servant, as from the "appointed day." At that time, the arbitration and the terms of sale might not be settled, and it would be impossible for him to devote himself, as Secretary of the Company, to the proprietors' interests concurrently with his new position

as Secretary in the service of the Water Board. And, beyond this, there would be considerable work to be done in winding up the Company's affairs after the terms of arbitration had been settled and acted upon. The matter was thoroughly threshed out by the Directors, Solicitors, and Counsel. With respect to the gratuity, the Secretary's salary had not been raised since Christmas, 1896, and within that period the capital of the Company had been increased 24 per cent., the number of supplies 15 per cent., the population 15 per cent., and the amount of water-rates 26 per cent. During the same period, the Company had had three Bills in Parliament, the great droughts, the Llandaff Commission, the London County Council Bills, and other circumstances which had greatly added to the weight of anxieties devolving upon that officer. Mr. Crookenden had served the Company faithfully and well, and to the great advantage of the proprietors in many ways.

Mr. BANBURY, in seconding the motion, also referred in warm terms to the eminent services which had been rendered to the Company by Mr. Crookenden.

A discussion followed, in the course of which the resolution was opposed by Mr. COLLINS and Mr. BROWN—the former regarding the proposal as "premature and over-generous;" but it was supported by Mr. BURNESS, Mr. D. HILL, and Mr. LANE.

The CHAIRMAN, in reply, again referred to the exceptional services of Mr. Crookenden, and maintained that the proposed *honorarium* and pension, so far from being too liberal, were small compared with the enormous amounts saved for the Company by the Secretary. He then put the motion, and having declared it carried unanimously, expressed his obligations to Mr. Collins and Mr. Brown for not pressing their opposition to a division.

The SECRETARY, in reply, said there had been some misapprehension as to the period of the pension, which would not begin until the transfer of the Company's undertaking to the Water Board. In the interval there would be a very serious and uphill fight, and, if he might say so, it would require great skill on the part of all the officers to steer the barque of the East London Water Company as it should be steered. In conjunction with his colleagues, it would give him great pleasure to do all he could; and he had every hope that, when the award came out from the Arbitrators, the proprietors would not be dissatisfied with the result.

Votes of thanks to the Chairman, Directors, and the staff were afterwards passed, and the proceedings terminated.

Gas v. Electricity at Lewes.—A long and animated discussion took place in the Lewes Town Council last week over a proposal of the Highways and Works Committee that the streets should remain lighted by gas as at present. The incandescent system which has been installed by the Gas Company, however, met with very general approval; and a suggestion that the recommendation should be deleted from the Committee's minutes was in the end negatived by a large majority.

WEST GLOUCESTERSHIRE WATER COMPANY.

The report which was adopted at the recent half-yearly meeting of the West Gloucestershire Water Company stated that during the six months ending Aug. 23, 187 additional services had been laid on, making the number of houses and other properties supplied by the Company at that date 8557, which, together with some meter and miscellaneous supplies, were estimated to produce a water-rental of £8190 per annum. This was an increase of £211 during the six months. To this total had to be added about £200 for rent of property, &c., making a total estimated annual income on that date of £8390. The Royal Assent was given on July 22 to the Bill promoted to give effect to the arrangement between the Great Western Railway Company, his Grace the Duke of Beaufort, and the Company. Several extensions were carried out during the half year, and considerable progress was made with mains to supply the district around Badminton. One auxiliary engine and pumps, at Frampton, were expected to be completed before the day of the meeting. An offer by tender of shares under the Act of 1899 was now before the public; but, at the moment of writing the report, the Directors were not in a position to state the result. The accounts showed that, after paying all working expenses and interest on debenture stock, there was a net profit earned of £2649, which, with £30 brought forward from the last balance-sheet, and £600 carried from the commutation fund, made a total of £3279 available for distribution. The Directors recommended the declaration of a dividend (less income-tax) at the rate of 5 per cent. per annum, applicable for the six months, upon the shares under the Act of 1884, and 3½ per cent. upon the shares under the Acts of 1887 and 1899. This would absorb the sum of £3250, leaving a balance of £29 to be carried forward.

Water-Works Extensions at Merthyr Tydfil.—The Merthyr Tydfil District Council intend to ask Parliament for powers to construct 16 miles of aqueduct in connection with their water-works. The scheme will probably cost £100,000. The 12-inch mains will be replaced by 20-inch ones from the Upper Neuadd reservoir to Dowlais, in order that the supply to the works in the locality may be increased from half-a-million to a million gallons per day.

Huddersfield Water Supply.—It is stated that a protracted meeting of the Huddersfield Town Council was held in Committee last Friday week to consider the position of the water-works. The members of the Council are reported to have been pledged to secrecy; but it is said that a very definite resolution was arrived at with regard to the future engineering control of the works. The Butterley and Blakeley reservoirs have occupied about eleven years in construction; and the estimated period for the work was five years. The estimated cost has been exceeded by one-half; and the Butterley reservoir is not yet water-tight.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 931.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
590,000	10	Apl. 11	10½	Alliance & Dublin 10 p.c.	19½—20½	..	5 2 5
100,000	10	,,	7½	Do. 7 p.c.	13—14	..	5 7 2
300,000	100	July 1	5	Australian 5 p.c. Deb. .	100—102	..	4 18 0
200,000	5	May 14	6½	Bombay, Ltd. . . .	6—6½	..	5 0 0
40,000	5	,,	6½	Do. New, £4 paid	4½—4¾	..	5 9 5
380,000	Stk.	Aug. 14	12	Brentford Consolidated	249—254	..	4 14 6
270,000	,,	,,	9	Do. New . . .	184—189	..	4 15 3
50,000	,,	,,	5	Do. 5 p.c. Pref. .	125—130	..	3 16 11
206,250	,,	June 17	4	Do. 4 p.c. Deb. .	111—114	..	3 10 2
220,000	Stk.	Sept. 11	10⅝	Brighton & Hove Orig.	207—212	..	5 1 5
246,320	,,	,,	7⅜	Do. A. Ord. Stk. .	152—157	..	4 18 9
460,000	20	Sept. 26	10	British.	39—40*	..	5 0 0
50,000	10	Aug. 14	12	Bromley, Ord. 10 p.c. .	22—24	..	5 0 0
82,850	10	,,	9	Do. 7 p.c. . . .	18—20	..	4 10 0
500,000	10	May 14	7	Buenos Ayres (New) Ltd.	10—11	..	6 7 3
250,000	Stk.	June 24	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
150,000	20	July 11	8½	Cagliari, Ltd. . . .	21—23	..	7 3 6
100,000	10	Sept. 26	10	Cape Town & Dis., Ltd.	14⅜—15⅝*	..	6 9 0
50,000	50	May 2	6	Do. 6 p.c. 1st Mort.	54—56	..	5 7 2
550,000	Stk.	Apl. 11	12½†	Commercial Old Stock	267—272	..	4 11 11
251,875	,,	,,	9⅜†	Do. New do. .	205—210	..	4 10 6
271,875	,,	June 12	4½	Do. 4½ p.c. Deb.	130—134	..	3 7 2
800,000	Stk.	May 28	9	Continental Union, Ltd.	138—143	..	6 5 10
200,000	,,	,,	7	Do. 7 p.c. Pref.	147—152	..	4 12 1
575,000	Stk.	Aug. 28	5⅝	Crystal Palace Ord. 5 p.c.	118—123	..	4 6 8
60,000	,,	,,	5	Do. 5 p.c. Pref. .	120—125	..	4 0 0
106,158	,,	July 11	5	Do. 5 p.c. Deb. Stk.	139—142	..	3 10 5
486,090	10	July 30	10½	European, Ltd. . . .	17⅛—18½	−½	5 13 6
354,060	10	,,	10½	Do. £7 10s. paid	13—14	..	5 12 6
15,243,200	Stk.	Aug. 14	4	Gas- 4 p.c. Ord. . .	87—89	..	4 9 11
2,600,000	,,	,,	3½	light 3½ p.c. max. .	88—90	..	3 17 9
3,799,735	,,	,,	4	and 4 p.c. Con. Pref.	107—109	−1	3 13 5
4,193,975	,,	June 12	3	Coke 3 p.c. Con. Deb.	92—94	..	3 3 10
70,000	10	Nov. 13	8	Hongkong & China, Ltd.	14—15	..	5 6 8
3,800,000	Stk.	May 14	10	Imperial Continental .	205—207	..	4 16 7
473,600	Stk.	Aug. 14	3½	Do. 3½ p.c. Deb. Red.	98—100	..	3 10 0
561,000	Stk.	Aug. 28	10	Liverpool United A	226—228	..	4 7 9
718,100	,,	,,	7	Do. do. B .	165—167	..	4 3 10
306,083	,,	June 24	4	Do. do. Deb. Stk.	116—118	..	3 7 10
75,000	5	June 12	5	Malta & Medn., Ltd. .	4¼—4⅜	..	5 5 3
560,000	100	Oct. 1	5	Met. of 5 p.c. Deb.	104—108*	+½	4 12 7
250,000	100	,,	4½	Melbourne 4½ p.c. Deb.	102—104*	+1⅛	4 6 7
541,920	20	June 12	5½	Monte Video, Ltd. . .	9—10	..	7 0 0
1,515,832	Stk.	Aug. 8	4½	Newc'tle & G'tesh'd Con.	103½—104½	+½	4 6 2
340,855	Stk.	July 4	3½	Do. 3½ p.c. Deb.	99—100	..	3 10 0
303,000	Stk.	—	8	Oriental, Ltd. . . .	—	..	—
60,000	5	Sept. 26	7	Ottoman, Ltd. . . .	6—6¼*		5 7 8

* Ex div.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.	GAS COMPANIES.			£ s. d.
851,070	10	Apl. 25	7	River Plate Ord. . .	10—10⅛	..	6 13 4
300,000	Stk.	June 24	4	Do. 4 p.c. Deb. .	93—96	..	4 3 4
250,000	10	Sept. 26	8	San Paulo, Ltd. . . .	11⅜—12⅛*	..	6 8 0
135,000	Stk.	Sept. 11	10	Sheffield A	236—238	..	4 4 0
209,984	,,	,,	10	Do. B	236—238	+1	4 4 0
523,498	,,	,,	10	Do. C	236—238	+1	4 4 0
6,000,000	Stk.	Aug. 14	5⅛	South Met., 4 p.c. Ord.	120—123	..	4 6 8
1,700,000	,,	July 11	3	Do. 3 p.c. Deb. . .	91—93	..	3 4 6
380,940	Stk.	May 14	5	Southampton Ord. . .	102—106	..	4 11 4
87,950	,,	July 11	4	Do. 4 p.c. Deb.	102—105	..	3 16 2
120,000	Stk.	Aug. 28	6	Tottenham and Edmonton A. 5 p.c.	118—123	..	4 17 7
300,520	,,	,,	4½	Tottenham and Edmonton B. 3½ p.c.	93—98	..	4 11 10
182,380	10	Jan. 16	5	Tuscan, Ltd.	7—8	..	6 5 0
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	95—98	..	5 2 0
230,000	5	Aug. 14	9½	West Ham, 10 p.c. . .	10—11	..	4 6 4
172,000	10	,,	6½	Do. 7 p.c. . .	13½—14½	..	4 9 8
				WATER COMPANIES.			
780,599	Stk.	June 24	11½	Chelsea, Ord. . .	300—310	..	3 14 2
150,000	,,	,,	5	Do. 5 p.c. Pref. .	152—157	..	3 3 8
160,000	,,	,,	4½	Do. 4½ p.c. Pref. '75	140—143	..	3 2 11
175,785	,,	Sept. 26	4½	Do. 4½ p.c. Deb. .	137—142*	..	3 3 5
1,720,560	Stk.	Mar. 26	8	East London, Ord.. .	219—224	+1	3 11 5
654,740	,,	June 12	4½	Do. 4½ p.c. Deb. .	142—147	..	3 1 3
1,282,913	,,	,,	3	Do. 3 p.c. Deb. .	97—99	..	3 0 7
700,000	50		8	Grand 10 p.c. max..	110—115	..	3 9 7
310,000	Stk.	Sept. 26	4	Junction 4 p.c. Deb..	125—130*	..	3 1 7
708,000	Stk.	Aug. 14	14	Kent	285—295	..	4 14 11
160,000	,,	,,	7	Do. New, 7 p.c. max..	195—205	..	3 8 4
1,043,800	100	June 24	11	Lambeth, 10 p.c. max..	290—300	..	3 13 4
406,200	100	,,	8½	Do. 7½ p.c. max..	210—220	..	3 17 3
350,000	Stk.	Sept. 26	4	Do. 4 p.c. Deb..	125—130*	..	3 1 7
500,000	100	Aug. 14	12 5/10	New River, New Shares	390—400	..	3 4 0
1,000,000	Stk.	July 30	4	Do. 4 p.c. Deb..	125—130	..	3 1 7
902,300	Stk.	June 12	7	South-wark and Vauxhall Ord. . . .	195—200	..	3 10 0
126,500	100	,,	7	South-wark and Vauxhall 7½ p.c. max.	180—185	..	3 15 8
489,200	Stk.	,,	5	South-wark and Vauxhall 5 p.c. Pref. .	152—157	..	3 3 8
1,019,585	,,	Apl. 11	4	Vauxhall 4 p.c. A Deb.	125—130	..	3 1 7
1,155,066	Stk.	June 12	10	West Middlesex. . . .	275—285	..	3 10 2
200,000	,,	,,	4½	Do. 4½ p.c. Deb. .	139—144	..	3 2 6
200,000	,,	Sept. 11	3	Do. 3 p.c. Deb. .	95—97	..	3 1 10

* Ex div.

† Next dividend will be at this rate.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The vacant post of Manager of the Dundee Corporation gas undertaking has been filled up by the appointment of Mr. A. Yuill, of Alloa. As I have pointed out more than once, the Town Council have, in this matter, displayed a tardiness for which no reason was given, but which observers everywhere put down to a desire to give Mr. Donald, the *locum tenens*, an opportunity of showing what he could do in the reconstruction of the retort-bench. It was therefore as likely that there should be further delay as that the meeting last Tuesday should proceed to make the appointment. That this was made must, I think, be attributed to the Donald party being unable to further prolong the *interregnum*. Their task in the Council was, indeed, hopeless, for they did not muster one-third of the members present. They surely must have been relatively stronger in the Committee. Now that the appointment has been made, I am free to say that I think a mistake would have been committed if anyone had been chosen who had not had experience in the management of gas-works. This ought to have been a fixed principle. It is too large a risk to place the control of the Gas Department in Dundee, particularly in these days of keen rivalry, in the hands of any but a tried man. The Town Council conducted the whole proceeding in private, and therefore we do not know how they were moved in the making of the appointment. It is one of the mysteries of this event in the history of gas supply in Dundee that the two newspapers which used to open their columns so freely to writers with gas grievances, have both allowed the selection of Mr. Yuill to pass without remark, either by their own staffs or by that handy man of the distressed editor—the anonymous correspondent. There is a view which I would very gladly accept as a solution of the present silence, which is that they have been asked not to make comments. This would mean that there was a disposition to let bygones be bygones, and to give Mr. Yuill a free hand in his work. It is devoutly to be wished that the Council will adopt this policy; but I question their ability to come to such a resolution on the evening of so pronounced a conflict.

The appointment of Mr. Yuill will be a popular one. He will be a good man for Dundee. His work at Alloa has shown him to possess sound judgment and a spirit of enterprise which few command. In the very fact of his selection there is encouragement, because it can be spelt into it that it was done with intention. The Council have settled £600 a year upon him. I have no doubt they could have got someone cheaper, but preferred to pay a good man a good salary. Mr. Yuill may go to Dundee with the assurance that the Town Council have asked him because they felt they could not find a better. With this assurance, there should also come the feeling that he will receive the support of the Council. He has already the support of considerably more than half, for 17 out of 28 members voted for him; and there were three absentees. I shall be greatly mistaken if he does not soon have the undivided support of the Council, and also the respect of the community. In fixing a salary of £600, the Council are not going beyond what they have already paid. The late Mr. John M'Crae, who died at the end of 1896, had a salary of £750 a year. His brother was appointed to succeed him at a salary of £350. So that, even though they are now advancing £250, they are still £150 below what they were paying six years ago.

A word as to the voting. In the first vote Mr. Donald had eight supporters, the same as he had in the final; but in the second vote he had eleven. There were evidently three gentlemen who preferred Mr. Donald to Mr. M'Lusky, but who, when he was out of the way, preferred Mr. Yuill to Mr. Donald. Mr. Yuill started with eight supporters, and in the final vote he had gathered to himself all the gentlemen in the meeting except those who were out-and-out supporters of Mr. Donald. It is a puzzle; but so it is.

The Edinburgh and Leith Gas Commissioners deserve the thanks of the community whom they serve. It is as Mr. Jamieson, one of their number, stated at their meeting last Monday—that when they found that, simultaneously with the equipment of large new gas-works, they were able to recommend a reduction of 4d. per 1000 cubic feet in the price of gas, they must conclude either that they had a very well-conducted undertaking or that they had otherwise a very favourable state of affairs. I do not think there was any need to mention an "otherwise." The undertaking is exceptionally well conducted, both in the works and in the office. Nothing could excel, for clearness and for power of conviction, the estimates which were laid before the Commissioners by Mr. John S. Gibb, the Treasurer. On reading the document, the feeling is that it is rather a report upon work done than a forecast of what is not yet accomplished. There is no haphazard in the estimates; there are solid grounds for every conclusion. And they are safe, inasmuch as they by no means touch the limits of deviation, on either side, and, as will be observed from the report of the meeting which I send [see p. 952], there is a hope that the year will end even better than is foreshadowed. It will also be seen that this expectation is founded largely upon anticipated economies in the working of the new works at Granton. It is the excellence of the management of Mr. Herring in the works which makes it possible for the Finance Department to submit the gratifying statement they have done. The price of gas has never been lower than it is now—3s. per 1000 cubic feet; but for more than three years before the late rise in the price of coal, it was sold at this figure. There is a very great difference, however, between then and now; and it is there that the personal element comes in. Since then half-a-million of money has been expended upon the new works at Granton, and it is under the increased burden of this additional capital that the price of gas has been reduced to its former level. A notable achievement has been effected—the forerunner, it is to be hoped, of favours in the same direction which are still to come. The Granton works are all but completed, and any day gas making may be started in them. It was contemplated they would be ready for use in the ensuing winter; and this has been accomplished. The report of the Engineer showed that

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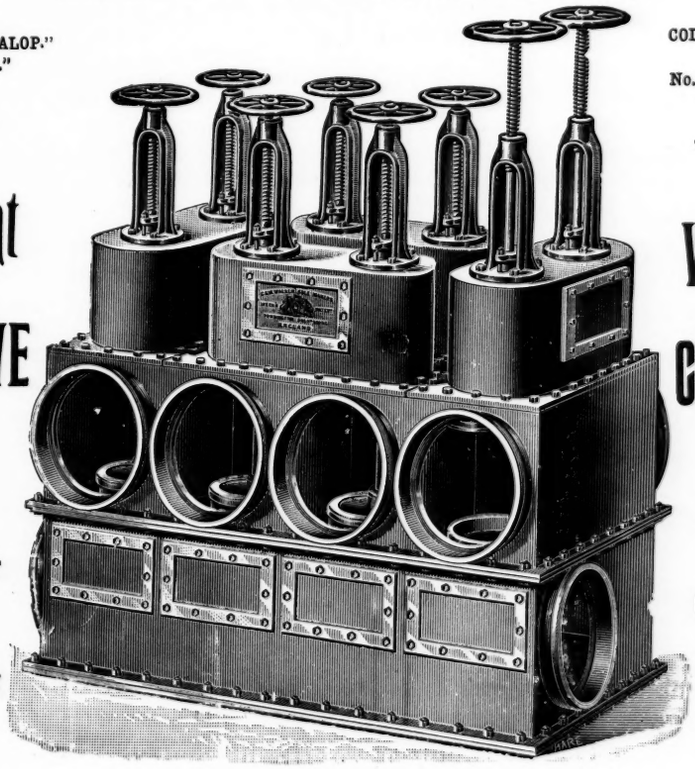

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during the month of August there was an increased output of gas to the amount of 2,172,000 cubic feet compared with that of the corresponding month of last year, and that since the 16th of May there has been an increase of 19,083,000 cubic feet over the quantity supplied in the same period of 1901. The Chairman (Mr. D. Purves) expressed gratification at this state of things.

The assessors of the various localities in which the works of the Edinburgh and Leith Gas Commission are situated have fixed the value of the Commissioners' undertaking for the current year at £70,375, compared with £43,010 last year—an increase of £27,365. Within the city of Edinburgh the valuation is £55,922, against £33,362; in the burgh of Leith it is £11,895, against £7830; and in the county of Mid-Lothian it is £2558, against £1818. In July and August last the Commissioners made three purchases of annuities, amounting, in all, to £195. The prices paid came to £5635, which is more than 28¾ years' purchase. At this rate it takes £28 18s. to extinguish £1 of annuity. As they have £33,400 still to acquire, the capital sum involved, at present rates, amounts to £965,260.

The Banff Gas Company have paid a dividend of 5 per cent. for the past year, and voted their Manager (Mr. W. Marshall) an honorarium of ten guineas for work done in connection with the erection of a gas-holder. The price of gas has been reduced 5d. per 1000 cubic feet. The holder has been erected upon the rocky site which was reclaimed from the sea two years ago. Though greatly exposed to the fury of the water, the concrete work of the tank shows no sign of being affected by the stress put upon it. It was built by the Company's own workmen, who have made an excellent job of it. The holder is of 18,000 cubic feet capacity, which is 1000 cubic feet more than the capacity of the other two holders. One of these, by the way, is of a class of which there are now very few, being inside a substantial building. Mr. Marshall bought his new holder from Messrs. Bruce, paper-mill owners at Kinleith, near Edinburgh; and it was taken down and re-erected by Messrs. Watson Bros., of Banff Foundry. A Maxim carburettor has been in use in the Banff Gas-Works for more than a year, and has been found to be of great benefit.

Two actions have been raised before Lord Low in the Court of Session, at the instance of the James Keith and Blackman Company, Limited—one against the Glasgow Corporation and the Incorporated Glasgow Exhibition, 1901, and the other against the Exhibition authorities alone. The nature of the actions has not yet been made public; but as senior counsel have been taken in at this early stage, it may be surmised that the questions raised are of some importance.

The accounts for the past year of the Peebles Corporation Gas Department were submitted to the Town Council this week for approval. At the request of Provost Ballantyne, Mr. Williamson, the Treasurer, said that the revenue from gas for the past year was £4249; from residuals, £558; and from cooker-rents, &c., £120—making a total revenue of £4927. This is less than in the previous year, on account of the reduction in the price of gas and residuals. The cost of manufacture, distribution, repairs and renewals, and salaries for the past year was £3643; annuities, including the portion falling now to be added to sinking fund, £580; interest and overdraft at the bank, £26; depreciation of machinery, meters, and cookers, £214; set aside to sinking fund, £228—making a total expenditure of £4691, and leaving a balance on the year's working of £236. From this balance they had to deduct £135, being the amount of claims for over-paid discounts written off by resolution of the Commissioners during the past year; thus leaving the net balance at £101. There were no estimates to submit that night; but some time ago the Commissioners reduced the price of gas to 3s. 4d. per 1000 cubic feet for ordinary purposes, and to 2s. 11d. for business purposes. It was very interesting to notice the progress made by the gas undertaking since it was taken over by the Commissioners. When taken over in 1898, the make of gas was 13½ million cubic feet, and it had risen to 24½ millions—an increase of 83 per cent. since the undertaking was taken over. The amount of money did not show the same apparent progress, because of the reduction in the price of gas. It might be further interesting to know, from figures prepared by Mr. A. Bell, the Manager, that there were 745 cookers and 132 grillers now in use, making a total of 877 cooking appliances; while four years age there was scarcely such a thing as a cooker in the town. When the Commissioners took over the works, the number of meters actually fixed was 925; while now there were 830 slot meters alone in use. The accounts were approved of.

On the afternoon of Wednesday last, a serious burst took place in the aqueduct conveying the water supply of the city of Aberdeen, at Culter, about 8 miles from the city. The accident occurred at a point where the aqueduct is carried through a deep valley by large cast-iron pipes. People in the vicinity were alarmed by a loud explosion near the public road, beside Culter Paper Mills. Immediately afterwards, a great jet of water rose in the air, falling upon the road. The force of the outburst soon swept away the earth in which the aqueduct was embedded, and undermined part of the roadway. About 12 feet of a stone dyke collapsed; and a similar length of the aqueduct, consisting of a pipe 3 ft. 4 in. in diameter, gave way, and was carried to the bottom of the valley.

I sometimes think that an explosion is quite a godsend to the newspaper reporter, there is such evident pleasure in his recounting of the details of the occurrence. We have had two this week. In Edinburgh on Monday night the cover of a manhole connected with the Corporation electric lighting undertaking was blown off in High Street. Such was the force of the explosion that the block, weighing about 1 cwt., was thrown 6 feet into the air. Happily no one was injured by the accident, but the street was without electric current, and therefore in darkness, for an hour. In Airdrie, on Wednesday, there was an explosion of gas, in the house of ex-Bailie Aitken, in Graham Street. In the morning it was found that there was a smell of gas in the dining-room, and Mr. Aitken's son struck a match with a view to locating the escape. The windows looking into the street were blown out with great violence, and the young man was somewhat severely burned. A good deal of damage was done to the furniture.

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	Cubic Feet Daily.
BLACKBURN	1,250,000
WINDSOR ST. WORKS, BIRMINGHAM	2,000,000
SALTLEY WORKS, BIRMINGHAM	2,000,000
COLCHESTER	300,000
BIRKENHEAD	2,250,000
SWINDON (New Swindon Gas Co.)	120,000
SALTLEY, BIRMINGHAM (Second Contract)	2,000,000
WINDSOR ST., BIRMINGHAM (Second Contract)	2,000,000
HALIFAX	1,000,000
TORONTO	250,000
OTTAWA	250,000
LINDSAY (Remodelled)	125,000
MONTREAL	500,000
TORONTO (Second Contract; Remodelled)	2,000,000
BELLEVILLE	250,000
OTTAWA (Second Contract)	250,000
BRANTFORD (Remodelled)	200,000
ST. CATHERINES (Remodelled)	250,000
KINGSTON, PA.	125,000
PETERBOROUGH, ONT.	250,000
WILKESBARRE, PA.	750,000
ST. CATHERINES (Second Contract)	250,000
BUFFALO, N.Y.	2,000,000
WINNIPEG, MAN.	500,000
COLCHESTER (Second Contract)	300,000
YORK	750,000
ROCHESTER	500,000
KINGSTON, ONT.	300,000
CRYSTAL PALACE DISTRICT	2,000,000
DULUTH, MINN.	300,000
CATERHAM	150,000
LEICESTER	2,000,000
ENSCHEDE (HOLLAND)	150,000
BUENOS AYRES (RIVER PLATE CO.)	700,000
BURNLEY	1,500,000
KINGSTON-ON-THAMES	1,750,000
ACCRINGTON	500,000
TONBRIDGE	300,000
STRETFORD	500,000
OLDBURY	300,000
TODMORDEN	500,000
SALTLEY, BIRMINGHAM (Third Contract)	2,000,000
YORK (Second Contract)	750,000
ROCHESTER (Second Contract)	500,000
NEWPORT (MON.)	250,000
TOKIO, JAPAN	1,000,000
PERNAMBUCO (Brazil)	125,000
MALTON	150,000
DULUTH, MINN. (Second Contract)	300,000

Complete Gas-Works at NELSON, BRITISH COLUMBIA.

LEEDS, 1,800,000 Cub. Ft. SMETHWICK, 500,000 Cub. Ft. LEICESTER (2nd Cont.), 1,000,000 Cub. Ft.
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CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Oct.* 4.

Sulphate of Ammonia.

The weaker tone at date of last report has been accentuated during the week, and the quotations at the close are £11 17s. 6d. per ton f.o.b, Hull and Leith, and £12 per ton f.o.b. Liverpool. Consumers still hold aloof, while speculators who have October contracts to cover are waiting a better opportunity. In the meantime, producers are displaying more anxiety to dispose of their output as it becomes available. In the forward position, London, Beckton terms, is quoted £11 13s. 9d. per ton, October-March delivery, and the same period, ordinary f.o.b. terms, is offering at £11 15s. to £11 17s. 6d. per ton. There is, however, speculative offering abroad at the parity of £11 10s. per ton f.o.b., but it does not attract much interest, buyers for the most part being indifferent.

Nitrate of Soda.

This is firm at 8s. 4½d. to 8s. 7½d. per cwt., according to quality on the spot.

LONDON, *Oct.* 4.

Tar Products.

Prices all round remain in about the same position; but there is certainly more inquiry for tar products generally. The position of pitch continues about the same; and there is still a very strong demand for home consumption. There is also a greater desire on the part of fuel makers to contract for January-June next; but, as a rule, distillers decline to sell, being uncertain with regard to their tar. In crude carbolic, 1s. 8½d. has been paid for November-December, while for prompt, dealers have in some instances been compelled to cover their requirements at 1s. 9d. Crystals are decidedly quiet; and there does not seem to be any business doing. Benzol remains in the same position. There is a slightly improved inquiry for 90 per cent., but principally for forward delivery. In anthracene there is very little business to report, and the market remains in about the same position. As regards toluol and solvent, there is nothing doing, and prices are purely nominal.

Average values during the week: Tar, 18s. 6d. to 24s. Pitch, London, 54s. to 55s.; east coast, 50s. to 51s. 6d.; west coast, 47s. 6d. to 48s. Benzol, 90 per cent., 8d. to 8¼d.; 50-90 per cent., 7½d. Toluol, 7d. Crude naphtha, 2½d. to 2⅝d.; solvent naphtha, 7½d. to 8d.; heavy naphtha, 9d. Creosote, London, 1⅝d. to 1½d.; North, 1⅝d. to 1¼d. Heavy oils, 1⅛d. Carbolic acid, 60 per cent., 1s. 8¼d. to 1s. 8½d. Naphthalene, 30s. to 40s.; salts, 20s. to 22s. 6d. Anthracene, "A," 1½d. to 1¾d.; "B," 1d. nominal.

Sulphate of Ammonia.

The market is decidedly quiet; and prices are easier all round, except for early October, for which there is still a fair demand. The Gaslight and Coke Company now quote £12 for October, but would accept £11 12s. 6d. for November-December, while for January-March they ask £11 16s. 3d. In Leith, there does not appear to be any business doing; and it is difficult to fix the actual value. Probably £11 17s. 6d. is a fair average quotation for October delivery, although even at this there do not appear to be any buyers. In Hull, business has been done at £11 17s. 6d. to £11 18s 9d. for prompt shipment, while in Liverpool small sales were made at £12 prompt, and £11 16s. 3d. shipment end of October. There seems an almost entire absence of business; buyers not being at all anxious for supplies.

COAL TRADE REPORTS.

Lancashire Coal Trade.

The position is very firm as regards all descriptions of house coal. The hardening of prices in some portions of Yorkshire and Derbyshire necessarily tends to strengthen the market here, though, as intimated last week, there has been no announced advance of list rates by the coalowners in the Lancashire district. Requirements are now steadily levelling up to the output, with pits mostly getting on to pretty nearly full time; and as increasing demand will now naturally come forward as the season progresses, some more or less general advance of list rates is very probable not later than the close of the present month. At the pit-mouth, prices are strong, with a tendency to harden, on the basis of about 13s. 6d. to 14s. per ton for best Wigan Arley, 12s. to 12s. 6d. for Pemberton four-feet and seconds Arley, and 9s. 6d. to 10s. for common house coal. There is still no improvement to report with regard to other descriptions of fuel for iron-making, general manufacturing, and steam purposes, supplies of both common round coal and engine fuel continuing more than ample to meet requirements, with increasing quantities of the lower qualities of fuel coming on the market from outside districts. The unsatisfactory condition of the iron and engineering branches of trade to some extent accounts for the present indifferent demand in steam and forge coals; and the shipping trade also remains unsatisfactory. Odd surplus clearance lots are to be picked up at specially cut figures; but the general rates for inland sales remain about steady, on the basis of 8s. 6d. to 9s. at the pit, and for shipment 9s. 6d. to 10s. for steam coal, delivered at Mersey ports. The better qualities of engine fuel move off the most readily; and it is exceptional where Lancashire collieries have much difficulty in disposing of their present output in the good qualities of slack, which are maintained at from about 6s. per ton for medium up to 6s. 6d. and 7s. for best sorts. In the commoner descriptions of slack, there is, however, a good deal of surplus output on the market, pressed for clearance sale at low figures, which may bring about some weakening in prices. At present these are without quotable change, 4s. 9d. to 5s. per ton remaining average figures for common Lancashire slack,

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with, however, Derbyshire slack offering freely at from 2s. 6d. to 3s. 6d. per ton at the pit.

Northern Coal Trade.

The demand for coal is full, and there have been exceptional inquiries from the United States, which have influenced the steam coal trade, and have certainly stiffened prices, though irregularly. For best Northumbrian steam coals, the quotation generally is 11s. 3d.; but for exceptionally early export higher prices are named. Second-class steams vary from 9s. to 9s. 9d. per ton f.o.b.; and steam smalls are quoted at from 5s. to 5s. 3d. The pits are rather better employed this week, partly through the abnormal demand made. In the Durham coal trade, there is a slow increase in the demand. In the gas coal trade, the home demand is improving; and some of the chief collieries have most of their output taken up for the winter. Durham gas coal ranges from 9s. to 10s. per ton f.o b., according to quality. Some contracts have been booked at about the first of the two prices above named; and some larger inquiries for next year for the Mediterranean are now in the market. Gas coke is in larger supply; but the price has not materially altered from last week.

Scotch Coal Trade.

The demand for coal for export is strong; but this will not be of long duration, as winter will soon close up the northern ports of Europe. In the meantime, there is plenty of work and a ready output for all the coal which is being sent up. The prices quoted are: Main, 8s. 3d. to 8s. 6d. per ton f.o.b. Glasgow, ell 9s 3d. to 10s. 3d., and splint 9s. 6d. The shipments for the week amounted to 284,693 tons—an increase of 58,567 tons upon the preceding week, and of 73,961 tons upon the corresponding week of last year. For the year to date, the total shipments have been 7,931,575 tons—an increase of 636,731 tons over the same period of last year.

Antwerp Water-Works Company.—The Directors of this Company announce that the working for the first half of the year shows, subject to debenture interest and income-tax, a net profit of £18,110, as compared with £16,501 for the same period of 1901. This enables the declaration of an interim dividend for the half year at the rate of 6 per cent. per annum, free of income-tax.

The Geltsdale Water Scheme Arbitration.—Mr. Thomas Gow, of Leeds, the Umpire in the recent arbitration case between the Carlisle Corporation and Mr. J. P. Watson, of Garth Marr, Castlecarrock (*ante*, p. 704), has made his award. The Corporation required an easement on the estate of Mr. Watson, for the purposes of the Geltsdale water scheme, to enable them to lay 1234 lineal yards of 20-inch pipe, with four air-valves and four scour-valves, and other works. Mr. Watson claimed £1200, and the Corporation offered £300. The Umpire has awarded £834; and the Corporation, in addition to this sum, will have to pay the costs of the arbitration.

Wells (Norfolk) Gas Supply.—We are reminded by a correspondent that in the spring of 1899 we published a somewhat adverse account of the gas-works at Wells (Norfolk). He encloses a cutting from a local paper to show that the undertaking, which is in the hands of the District Council, and under his management, is on the up-grade, though not to the extent he could wish. Certainly, he is handicapped with antiquated works (erected in 1845), which are not provided with either a governor or an exhauster, both of which have been recommended, as well as larger mains, by a London and two local gas managers. With this defective plant, the Manager, who receives the munificent salary of £20 per annum, produced a fairly good result in the past financial year, as shown by the accounts. The expenditure was £478, and the revenue £568; and the public lighting was done at cost price—£73. If this is not a unique gas undertaking, we should fancy the salary of its Manager is a record.

Gas Supply to Heaton and Frizinghall.—The minutes submitted to the last meeting of the Shipley District Council recorded the attendance of a deputation from the Gas Committee of the Bradford Corporation with reference to the proposal for the sale to the Corporation of the right to supply gas in Heaton and Frizinghall districts, and the agreement to recommend the District Council to transfer their rights for £31,000; the area within the Shipley district now supplied by Bradford to be transferred to Shipley on a like basis as to cost. Mr. James Roberts, in proposing the adoption of the minutes, spoke of the friendly way in which the Shipley Committee were met by the Bradford Gas Committee. If, however, any less sum than £31,000 had been offered, the Committee would not have felt it right to ask the Council to agree, but would have proposed that the matter should go before an arbitrator. They would, of course, have preferred to continue supplying the gas; but they were compelled by the terms of their Bill to sell if required. The motion was adopted.

Sale of Coal by Corporations.—A somewhat unusual question was raised at last week's meeting of the Bury Town Council. The minutes of the Gas Committee showed that a letter had been received from the Elton Cop Dyeing Company asking if the Committee could supply them with coal; and it had been resolved to inform the Company that the Committee could not see their way to comply with the suggestion. The confirmation of the minutes having been moved and seconded, Dr. Greenhalgh moved that this matter be referred back for further consideration. He congratulated the Company upon their boldness in tackling the Gas Committee on this question, and argued that as the Committee already sold coke they could sell coal. Mr. R. Kay seconded the amendment. In the course of a discussion which followed, Mr. L. Fletcher, the Chairman of the Gas Committee, pointed out that the carrying out of the suggestion would entail the establishing of another department. The Town Clerk said the Council had no statutory power to enter into a trading concern of that character. Dr. Greenhalgh thereupon withdrew his amendment, and gave notice that he would move a resolution that powers be obtained, if necessary, by a Parliamentary Bill. The minutes were confirmed.

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Height from floor to top of flue	21½ in.

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M	Ground, Polished, and best Stove-Enamelled	63/-
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P	" " " " with Sides, Top Panels, and Canopy Victoria Bronzed	90 6
R	Whole Stove Victoria Bronzed	123/-
S	" " Electro-Brassed and relieved in Silver	138/-
U	Whole Stove Electro-Brassed	138/-

A Burst Main at Liverpool.—One of the 44-inch mains which convey water from the reservoirs of the Liverpool Corporation at Prescot to the city, burst in the afternoon of last Monday week. The water rushed forth with considerable force, and carried before it tons of earth, washing away the macadam from the roadway. For a distance of over a hundred yards, the curbs and channels were strewn about in all directions; and in some instances the footpath has been washed away to a depth of several feet. A large gang of Corporation workmen were very soon on the scene, and active operations were commenced to repair the damage. It is only about twelve months since the same line of pipe burst a short distance away from the present break.

Gas Supply in Frankfort.—We learn that the shareholders of the Frankfort-on-the-Main Gas Company have approved an alteration of the statutes whereby the Directors and Board of Supervision have been authorized to enter into agreements with other companies in regard to the conduct of business on a mutual basis and the division of the proceeds. In connection with the alteration, the "Frankfort Gazette" states that at a recent meeting the shareholders sanctioned an agreement proposed to be entered into with the Imperial Continental Gas Association in the sense of the modification of the Company's statutes, with the object of removing the competition now existing between the two undertakings. No details of the agreement were, however, placed before the meeting.

New Stour Bridge for the Isle of Thanet and Margate Water Supply.—In the presence of a large and prominent body of gentlemen, the above-named bridge, which will join more closely the Isle of Thanet with the mainland, was opened by the Dr. A. Flint, the Chairman of the Rural District Council, on the 22nd ult. The bridge is a handsome structure. It is about 120 feet long, and the principal span is 64 feet long. It is 17 feet wide. The bridge is of the iron girder type, supported on four immense cast-iron cylinders, which extend into the earth to a depth of 77 feet, measured from the under part of the bridge. Their sinking to this great depth was necessary in order to reach the solid sub-soil. Great difficulty was experienced in sinking these cylinders on account of various strata of moving sands being met with. The space between the solid sub-soil and the bottom of the river is over 50 feet. The ends of the bridge, where they are landed on the sides of the river, are taken by concrete blocks 25 feet wide and 17 feet deep; and these in turn float on piles. The bridge was tested with a load of 54 tons, consisting of a locomotive weighing 15 tons, with 9 tons on the hind wheels, and three trucks each loaded and weighing 13 tons. The test was made in the presence of the Engineers; and it was found that the bridge oscillated under this weight less than an eighth-of-an-inch and the depression was *nil*. The Engineers were Messrs. William A. Valon and Arthur Valon. The new bridge is intended to carry the water-pipes for the conveyance of water from Wingham to Margate—a distance of 16 miles. This scheme has lately been sanctioned by the Margate Corporation, and will for the future form the main supply of water to that town.

Bursting of a Manchester Water-Main.—An accident occurred last Tuesday in connection with the second pipe line which is being constructed from Thirlmere to Manchester. Ten minutes after the men ceased work that night, one of the old pipes burst a mile south of Caton. The water speedily filled the trenches in which the men had been working, and then rushed down the valley, flooding a farm-house and other buildings before it found its way into Artle Beck. A subsequent inspection of the burst pipe showed that it had been resting on a sharp stone, which had split the pipe its entire length.

Water-Works Extensions at Southampton.—On the recommendation of the Water Committee, the Southampton Borough Council have decided to apply for sanction to borrow £4000 for the purpose of driving 1800 feet of heading at the Otterbourne Water-Works, and £6000 for the duplicating of the pumping main. Mr. Blakeway, in moving the adoption of the Committee's report, said the demand now made on the water-works was very great, largely through the fact that they had a big consumption for trade purposes. There was no reason why the demand should decrease; and they should make quite sure that they had sufficient water to supply it. They were in a very serious position, unless they carried out at once the duplication of the pumping main. They had a double main from the works at Otterbourne to Southampton; but they only had one main from the reservoir to Otterbourne Hill. Although the extra £10,000 which the Committee asked the Council to sanction that day would involve an addition to interest and sinking fund, he was pleased to be able to inform the Council that, so far from there being any need for anxiety about the ability of the water undertaking to meet the outlay, he believed he was correct in saying that they had already a considerable sum in excess of their estimate on the receipts side.

Water-Works Extensions at Plymouth.—An inquiry was held at Plymouth on Tuesday last by Mr. W. A. Ducat, one of the Inspectors of the Local Government Board, concerning an application by the Corporation for power to borrow £30,000 on water-works account. Mr. F. Howarth, the Water-Works Engineer, explained that £10,488 was required for extensions of mains in new building areas within the district of supply, £6902 for the renewal of mains, £2000 for meters, and £6576 for land. The Town Clerk (Mr. J. H. Ellis) said there was some doubt as to their ability to obtain the land without compulsory powers; and he suggested that the Inspector should report in such a way that, if these powers had to be sought, the Corporation might obtain possession without the necessity of another local inquiry. He further explained that part of the sum applied for was for the purchase of certain water rights from the Devonport Water Company. The boundary of the borough of Plymouth had been extended so as to include part of the district of Pennycross, in which the Devonport Water Company had, with the Plymouth Corporation, a concurrent right of supply. The Corporation agreed to buy the Company out; and it had been decided by arbitration that the Corporation should pay them about £3000. They proposed to borrow this sum under the powers conferred by the Act extending the borough.

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The Reinstatement of Roads.—At Bristol, the work of reinstating the roads after disturbance for gas, water, and other purposes is undertaken by the city authorities; the Company responsible for the outlay paying the cost. Some idea of the extent of these operations in a twelvemonth will be gathered when it is stated that work to the value of £3360 was done for the Gas Company last year, £1727 for the Tramways Company, £78 for the Water Company, and £43 for the Telephone Company.

Eccles and the Price of Salford Gas.—There is a feeling in Eccles that the Salford Corporation could well afford to reduce the charge they make for gas supplied to the town, and at the last meeting of the Council, Mr. Grindle moved that the Public Lighting and Electricity Supply Committee should wait upon the Salford Gas Committee with the object of urging a further reduction in the price of gas to consumers in the borough, and a special reduction to consumers using gas for cooking and manufacturing purposes. Alderman Spary seconded the motion; but several members of the deputation who went to Salford in December last intimated their refusal to go so soon again on a similar errand, because of its futility. On being put to the vote, the motion was declared lost.

Public Lighting of Salisbury.—Last Thursday, the Salisbury Town Council had before them for consideration tenders by the Gas Company and the Electric Light Company for the public lighting of the city. The offers were as follows: Gas Company, No. 1, 25,250-candle power, £778 8s. per annum; No. 2, 30,250-candle power, £845 15s. per annum; No. 3, 46,250-candle power, £947 8s. per annum. Electric Light Company, 34,816-candle power, £1205 per annum. It was pointed out that the contract with the Gas Company was still running; and Mr. Harris said he did not think it was fair to subject the Company to competition until they had shown that they had failed to carry out their contract. He moved that tender No. 1 of the Gas Company should be continued; and after some discussion, during which the good service rendered by the Gas Company was freely acknowledged, this motion was carried.

An Electricity and Power Gas Scheme for Cheshire.—A big scheme is on foot to supply Cheshire and the northern portion of Staffordshire with electricity; the area to be embraced extending over 1770 square miles, and having a population of about 1½ millions. Parliament is to be applied to for power to erect electric generating stations throughout Cheshire, and the northern part of Stafford; and the capital will, it is said, be £1,500,000. The chief object of the Company is to supply electricity and produce gas for power purposes; but it is not intended to encroach upon the rights of the local authorities to deal with the distribution of electric energy within their respective areas. The Company will supply electricity in bulk; conveying it ready made to the authorities and others requiring it, at cheaper rates than they can produce it themselves. For this purpose, three power stations are to be erected—one in Sutton, just outside Macclesfield; another near Stone, in Staffordshire; and the third near Frodsham.

Accident to a Reservoir at Harrogate.—It is reported that a settlement has taken place on the top portion of the embankment in the outer slope of the Scargill reservoir, one of the Harrogate reservoirs now fast approaching completion. Steps have been taken to relieve this portion of the embankment. The inner slope of the embankment has not been in any way affected; and the occurrence will simply mean a delay in the completion of the work. There are 36 feet of water in the reservoir; but the lowest portion of the settlement is considerably above the level of the water.

Water Profits to Pay Electric Light Losses at Derby.—At the meeting of the Derby Town Council last week, a long discussion took place on a recommendation of the Finance Committee that a sum of £7823 should be applied out of the water-works profits to cover the deficiency on the electric lighting account for the past two years. Alderman Sir Henry Bemrose, as Chairman of the Water Committee, protested against such a course, and said they were endeavouring to establish a strong reserve fund for when the Derwent Valley Water Board made calls upon them, as they would do ten years hence. He complained, also, that the course proposed was both unbusinesslike and unusual. The resolution, however, was in the end carried by a substantial majority.

Suffocations by Gas.—Last Saturday week, a middle-aged married couple, named Fennell, were found in bed, the husband dead, and the wife so ill that she has since died, from gas poisoning, at Cowhill, near Oldham. An investigation showed that the leakage of gas arose from a nail having been accidentally driven through the pipe in the wall. On the same afternoon, at a Glasgow hotel, a maid-servant found that the door of a bed-room occupied by a gentleman named William Chamberlain, was locked, and a strong smell of gas emanating from the apartment. On the door being forced, Mr. Chamberlain was found dead in bed, and the gas-tap turned full on. Deceased, who was about 70 years of age, arrived at the hotel the previous evening, and gave orders to be called for breakfast next morning.

Gas Explosion at an Oldham Mill.—An explosion which appears, from the rather confused account that has reached us, to have completely wrecked the offices of the Pearl Mill at Oldham, occurred there a few days ago. The gas-meter which formerly did duty, and had been located in a cellar underneath the offices, was removed some weeks since for repairs. Meantime, a meter-house has been erected outside the offices; but as the meter was not ready for fixing, Corporation workmen were busily engaged in connecting up the gas-main with the supply-pipe in the meter-house, to allow gas to pass through into the mill without measurement. The connection had been completed, and all was thought to be ready for turning on the gas. But, unfortunately, one of the pipes (so it is alleged) had been left with an open end. The cellar being somewhat dark, two or three lights were always left turned low; and the gas from the open pipe, gradually accumulating, must at length have reached the lights and exploded. As stated, the offices were wrecked; but happily personal injuries were slight.

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New Water Supply for Peterborough.—The city of Peterborough having outgrown its present supply of water, which is conveyed some 14 miles by a single main, the question arose of either duplicating the main or finding an additional source. The Corporation have been most successful in the latter, having obtained water from trial holes at Etton, some six miles from the city, which will provide sufficient water for another thirty years. The water is pronounced to be of an exceptionally good quality, and it will blend well with the present Braceborough supply. The cost of bringing the water from Etton to Peterborough is roughly estimated at £16,000; and the works are to be pushed forward with as little delay as possible.

Luton Gas Company.—At the half-yearly meeting of the Luton Gas Company last Friday, it was reported that the sale of gas during the past six months had shown a larger increase than in any corresponding period. The quality had been considerably above the parliamentary standard; while the laying of larger mains and the renewal of old services kept the staff busy. Through the reduction in the price of coal, the Company had been able to reduce the price of gas to the figure at which it stood at Midsummer, 1900—viz., 2s. 5d. per 1000 cubic feet; the reduction of every penny meaning a decrease of £1000 in the rental. The Chairman, Directors, and Manager (Mr. W. R. Phillips) were cordially thanked for their attention to the interests of the Company.

Charge of Embezzlement against a Collector at Southampton.—At the Southampton Borough Police Court recently, a man named Stubbington, late a collector in the employ of he Southampton Gas Company, was brought up on a warrant charged with feloniously embezzling and stealing the sum of £25, the money of the Company, between Aug. 28 and Sept. 2 last. Mr. A. C. Hallett, who prosecuted, stated that Stubbington's duties included the collection of amounts from slot-meters. On Aug. 28, he was given a book containing about a hundred receipts, and instructed to collect accounts in the Eastleigh district. As he failed to report himself at the office in the usual way, inquiries were made, and a warrant issued. Stubbington was arrested in London. During the dates mentioned, he collected a total of £25 13s. 11d., and had not paid any part of this amount into the bank, as he should have done. Accused pleaded guilty, and said he had £14 on him when he went for his money on the Saturday, but had not his bank-book with him. In the course of the day, he had the misfortune to lose the money. It worried him so that he went away to London on the Monday, after collecting another £11. Mr. Crowther Smith said the Company had brought the case forward with a view of an example being made which would act as a deterrent. They had no wish to press the charge, and regretted having had to prosecute Stubbington, who, so far as they knew, had previously discharged his duties faithfully. The Bench sentenced prisoner to one month's hard labour, the Mayor remarking that his excuse had not helped him, for if he lost the £14 he had sufficient energy to collect another £11; and all of the money with the exception of 2s. had gone.

Derwent Valley Water Board.—The Derwent Valley Water Board have decided to construct, under an arrangement with the Sheffield Corporation, a joint aqueduct from the Derwent reservoir to the mouth of the Sheffield tunnel near Ladybower, instead of the two aqueducts at present authorized to be constructed by the Board and the Corporation respectively. At Ladybower the Corporation will take the water unfiltered from the aqueduct. The Sheffield Corporation will, in the next parliamentary session, ask for the necessary sanction for this alteration of the original plan.

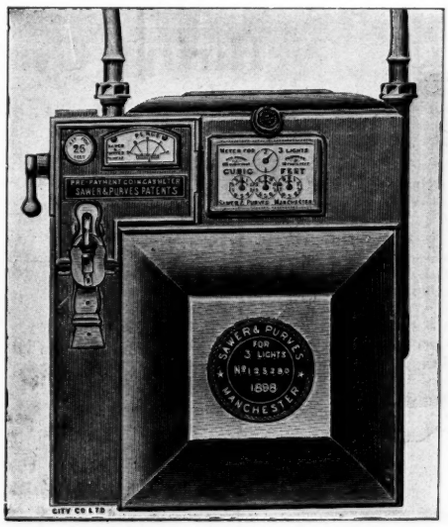
Tree-Trunk Water-Pipes.—Bond Street, along both its old and new sections has been recently littered with decayed and hollow tree-trunks. These have been unearthed in the process of laying a new water-main, and are said to have reposed for 350 years below the roadway. At one time they served to carry the water supply to St. James's Palace; and as their diameter is about 10 inches, no reasonable complaint could have been sustained in the past against their carrying capacity. Each length is about 6 to 8 feet of roughly trimmed tree-trunk, with one end tapered to insert in the butt end of another.

Dorking Gas Company.—The Directors of the Dorking Gas Company, in their report for the half year ending June 30 last, stated that, after providing for the interest on the debenture stock, the accounts showed a balance available for dividends of £2266; and they recommended the payment of maximum dividends on all classes of shares. This would absorb £1319, and leave a balance of £947 to be carried forward to the next account. The sale of gas to private consumers had increased by 7·66 per cent. The extensions of the works were approaching completion; and it was hoped that the whole of this additional plant would be in operation early in the autumn. The contract for coal had been renewed at the same price as that of 1901, which, however, was still much above that paid in 1899. Coke, tar, and ammoniacal liquor had realized slightly less than the previous half year. The report was adopted by the shareholders at the meeting last week.

Gas Management at Sandwich.—Mr. J. Paton, who, for domestic and personal reasons, recently resigned the position of Manager of the Sandwich Gas-Works, which he had so well filled during the present year, is evidently leaving the historic town with the best wishes and goodwill of its citizens. Since Mr. Paton took charge of the undertaking last January, an important portion of the works has been entirely rebuilt, the mains and services in the town largely overhauled, and the public lighting reorganized—an efficient and satisfactory gas supply being maintained during the alterations under circumstances of an exceptionally difficult character. The universal esteem which Mr. Paton has won for himself in so short a time bespeaks a prosperous career for him in the new fields to which he is now going. It found expression at a recent meeting of the Gas Committee, when a vote was passed to present Mr. Paton with a cheque in recognition of the special services he had so ably and willingly rendered the town. Mr. Paton will leave many friends behind him.

FIRST IN 1889

THE POSITIVE DRY PREPAYMENT METER



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MANCHESTER.

Gas-Engines for the Glasgow Electricity Works.—At a recent meeting of a Special Sub-Committee appointed by the Electricity Committee of the Glasgow Corporation, to consider and report as to the expediency of providing one or more gas-engines of high horse power for the production of electric energy in cases of emergency, the Engineer (Mr. W. A. Chamen) made a verbal report on the information he had obtained from various makers of gas-engines relative to the adoption and manufacture of such motors for driving dynamos. He also reported (1) that the supplementary supply for the Tramways Department will not provide for the cases of emergency referred to in the remit; and (2) that it would take between two and three years to make and deliver engines of the description contemplated. Having considered and discussed the reports submitted, the Sub-Committee resolved to recommend that Mr. Chamen be authorized to visit, when he accompanies the deputation appointed with reference to street lighting by means of incandescent gas and incandescent electric light, certain cities in England, Belgium, and Germany, for the purpose of getting further information on the subject, and also to inspect one or more of the largest installations for which gas-engines have been adopted as the motive power for generating current, and to report thereon.

The Directors of the River Plate Gas Company, Limited, have resolved to declare an interim dividend of 6s. per share (being at the rate of 6 per cent. per annum), tax free, for the half year ended June 30.

Coal, said to be of good quality, has been found at Walsher Hill, Cowborough, by employees of the Water Company who were engaged in laying mains. It extended for about 50 yards, and was some 3 inches thick.

Messrs. F. C. Sugden and Co. have recently obtained orders for regenerator settings from the Ely and Bingham Gas Companies, and from the Birstal Urban District Council. In the last instance it is a second repeat order.

A fatal acetylene explosion occurred last Friday when two brothers named Grant, of Fauldhouse, Linlithgowshire, were examining their acetylene apparatus. The exterior of the generator was all right, and one of the men suggested looking inside with a match. He did so, and an explosion took place, blowing off half of his head. His brother, who was standing by, was unhurt.

We have received from John Wright and Eagle Range, Limited, a copy of a new artistic circular they are issuing, showing their "Acme" gas-heating novelties for the approaching winter season. They comprise three stoves of the usual type containing several improvements; a condensing gas-stove, fitted with argand burner, furnishing light and heat; a gas-heating apparatus suitable for halls, churches, corridors, and offices; and a gas-fire basket, which can be placed in an ordinary coal-grate without fitting. The circular is very neatly, yet effectively, printed.

Some Welsbach self-intensifying lamps of 300, 600, and 900 candle power, in one, two, and three light clusters respectively, have been specially imported and erected at their own cost in Main Street, Port Elizabeth, by the South African Lighting Association, for the purpose of showing the public the possibilities of high-pressure gas lighting. They are said to be the first of these lamps seen in South Africa.

The Banchory Gas Company earned a profit of £111 last year. They have paid a dividend at the rate of 1s. per share, and continued the price of gas at 7s. 6d. per 1000 cubic feet. At the meeting of the shareholders on Tuesday, the Chairman said he was gratified that they were able to sell gas at a cheaper rate than it is sold at in some places which are nearer the coalfields than Banchory. He also expressed the regret of the Directors at the death of Mr. James Barclay, who was their able and faithful Manager for 33 years.

Our advertisement columns show that there is a large amount of gas and water stock about to come on to the market, which is a healthy sign. Mr. Alfred Richards is to the fore with several sales by auction, including the Barnet District Gas and Water Company, Great Yarmouth Water Company, Harrow and Stanmore Gas Company, Ilford Gas Company, Lowestoft Gas and Water Company, Southend Gas Company, South Essex Water Company, Tendring Hundred Water Company, and West Ham Gas Company. Other auction sales are by Messrs. Alexander, Daniel, and Co., of Bristol Water-Works Company's ordinary stock; by Messrs. Sparks and Son, of Littlehampton Gas Company's shares; by Mr. Charles A. Joel, of Newcastle and Gateshead Water Company's stock; and by Mr. I. I. Cooper, of Reading Gas Company's stock. The Brompton, Chatham, Gillingham, and Rochester Water-Works Company are inviting tenders for an issue of £7500 of 3½ per cent. debenture stock, created under the powers of their Act of 1898. Tenders are to be in by Oct. 20.

Someone has made the discovery that there are too many of one family in the gas-meter testing office belonging to the Glasgow Corporation. In a minute of the Magistrates which was before the Town Council last Thursday, it was stated that there were in the office a chief inspector, at a salary of £190; a chief assistant, who is a son of the chief inspector, at a weekly wage of 38s.; four assistants, two of whom receive 32s. per week, one 25s. per week, and the fourth, who is also a son of the chief inspector, 24s. per week, the last named being twenty years of age. It was also stated that the hours of the employees are 9 a.m. to 5 p.m., with from 1¼ to 1½ hours for dinner, although the authorized time is one hour; that no work is done on Mondays except cleaning up the place, and that a practice has crept in of taking a week's holiday at the fair time and other public holidays in addition to the fortnight which was formerly given as holidays to each employee. The state of matters in the department was characterized by several members of the Council as scandalous. The Magistrates asked the authority of the Council to deal with the staff. Lord Provost Chisholm said they wished power to do what they considered right, and they would report. The powers asked were granted.

THE "REFORM" WITH "EXCELSIOR" FIRE.

PRICES.

No.	Sizes. Wide.	High.	Ball Fire.	"Excelsior" Fret Fire.	Coloured Porcelain Enamel.
1421	14in.	by 16in.	18s. 6d.	20s. 0d.	30s. 0d.
1423	15½in.	by 17in.	22s. 6d.	25s. 0d.	35s. 0d.
1425	17½in.	by 17in.	27s. 6d.	30s. 0d.	40s. 0d.

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Very thing

for

Hiring Out.

Intense Heat and Low Consumption.

Richmond's "Excelsior"

Fire has exceptional Advantages:—

1. **Splendid Heat.**
2. **Economical Consumption.**
3. **Fire composed of Fire-Brick, Iron-Frets, and Asbestos Fibre.**
4. **Charming appearance.**
5. **No loose fuel to fall out.**
6. **No Front Bars to obstruct radiant heat.**
7. **Everything removable.**

Messrs. Clapham Bros., Limited, of Keighley, have received an order from the Leeds Corporation for three purifiers, each 43 feet square, of the Green type, complete with 18 of their "New Century" covers, with patent "Eclipse" joint and rapid automatic fastenings, together with the necessary connections, valves, and lifting apparatus, to be erected at the Dewsbury Road works.

The following tenders have been received for the erection of a new retort-house for the Wellingborough Gas Company, on the site acquired by the Company for their new manufacturing plant in Union Lane: J. H. Smith, £2438; W. Berrill, £2100; Hacksley Bros., £2059; Goodman and Murkitt, £1975; W. Stevens, £1973; G. Henson, £1913; Berrill and Green, £1900; and E. Brown and Son (accepted), £1813 10s.

WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

SITUATIONS VACANT.

ASSISTANT-ENGINEER. Melbourne Gas Company. Oct. 31.
ASSISTANT-ENGINEER. Plymouth Gas Company. Oct. 21.
CLERK FOR ELECTRIC METER DEPARTMENT. No. 3922.
DRAUGHTSMAN. Ashmore, Benson, Pease, & Co., Stockton.
DRAUGHTSMAN. No. 3916.
DRAUGHTSMAN. No. 3918.
ENGINEER (Gas and Water). Leigh Corporation. Oct. 14.
ENGINEER AND MANAGER. Alloa Gas Department. Oct. 11.
GAS-FITTER. Nantwich Gas Company.
GAS-FITTER. Newport (Isle of Wight) Gas Company.
GAS-FITTER. No. 3925.
GAS-FITTERS. Birmingham Gas Department.
GENERAL FOREMAN. Midland District. No. 3914.
LIGHTING SUPERINTENDENT. Rotherham Gas Department. Oct. 8.
MECHANIC AND FITTER. Shipley Gas Department. Oct. 18.
REPRESENTATIVE (Malleable Iron Fittings). No. 3924.
REPRESENTATIVE FOR SOUTH AFRICA. Burbidge, Wilcox, & Co., London.
STOKER. Briton Ferry Gas Department.
STOKER. Purston Gas-Works.
STOKER. Sharpness Docks Gas-Works.
WORKING FOREMAN. No. 3926.
WORKING FOREMAN. No. 3927.

BUSINESS FOR DISPOSAL (Fittings, &c.).

POPPLETON AND APPLEBY, London. Oct. 9.

MEETING OF COMPANY.

DANISH GAS COMPANY. Oct. 28.

PLANT, &c. (Second-Hand), FOR SALE.

EXHAUSTER AND GASHOLDERS (various). Wright, London.
LANTERNS. Edgar, Hammersmith.
METERS (2 Light). No. 3923.
PURIFIERS. Mablethorpe Gas-Works.
PURIFIERS, SCRUBBER-WASHERS, GASHOLDERS, &c. Firth Blakeley, Dewsbury.

SALES OF STOCKS AND SHARES.

BARNET GAS AND WATER COMPANY. Nov. 4.
BRISTOL WATER COMPANY. Oct. 16.
BROMPTON, CHATHAM, GILLINGHAM, AND ROCHESTER WATER COMPANY. Oct. 20.
GREAT YARMOUTH WATER COMPANY. Oct. 28.
HARROW AND STANMORE GAS COMPANY. Oct. 28.
ILFORD GAS COMPANY. Oct. 21.
LITTLEHAMPTON GAS COMPANY. Oct. 7.
LOWESTOFT WATER AND GAS COMPANY. Oct. 21.
NEWCASTLE AND GATESHEAD WATER COMPANY. Oct. 14.
READING GAS COMPANY. Oct. 9.
SOUTH ESSEX WATER COMPANY. Oct. 21.
SOUTHEND GAS COMPANY. Oct. 28.
TENDRING HUNDRED WATER COMPANY. Oct. 21.
WEST HAM GAS COMPANY. Oct. 29.

TENDERS FOR

BUILDING AND IRON AND STEEL WORK.
ARDROSSAN GAS DEPARTMENT. Tenders by Oct. 9.
GAS-ENGINE AND ICE CRUSHER.
ISLE OF THANET ICE COMPANY. Tenders by Oct. 22.
INCANDESCENT FITTINGS AND ACCESSORIES.
POPPLETON AND APPLEBY, London. Tenders by Oct. 9.
INCLINED RETORT PLANT (Complete.)
BURTON-ON-TRENT GAS DEPARTMENT. Tenders by Nov. 28.
IRON AND STEEL WORK.
MANCHESTER GAS DEPARTMENT. Oct. 23.
MACHINERY.
ARDROSSAN GAS DEPARTMENT. Tenders by Oct 9.
OXIDE OF IRON.
EDINBURGH AND LEITH GAS COMMISSIONERS. Oct. 13.
RETORTS, FIRE BRICKS, &c.
ROCHESTER, CHATHAM, AND STROOD GAS COMPANY. Tenders by Oct. 13.
SULPHATE OF AMMONIA PLANT. No. 3921.

SOMETHING REALLY NEW!

STAMPED
STEEL
SLOTS.

WILLEY & CO., EXETER.

The Directors of the Buenos Ayres (New) Gas Company, Limited, have declared an interim dividend at the rate of 6 per cent. per annum for the half year ending the 30th of June last, payable on and after the 20th inst.

The Stettiner Chamotte-Fabrik Actien Gesellschaft, vormals Didier, of Stettin, have received an order for the construction of forty benches containing 360 inclined retorts, 5 metres long, for the new gas-works at Tegel, near Berlin.

The scarcity of water in Essex is becoming serious. At a meeting of the Saffron Walden Rural District Council last week, it was reported that wells in no fewer than seven villages had dried up, and that the inhabitants were experiencing considerable difficulty in getting a supply of water. Dr. Armistead (Medical Officer of Health) stated that the water in the chalk basin had gone down in some places as much as 30 feet. The total deficiency of rain during the last seven years was 24 inches, which was equal to a whole year's rainfall.

An extraordinary meeting of Messrs. C. & W. Walker, Limited, was held in Birmingham last Tuesday, at which it was decided to divide each of the existing £5 ordinary shares of the Company into five fully-paid £1 shares.

Owing to the expiration of the lease, Messrs. W. Sugg and Co., Limited, have given up their show-rooms at No. 2, Grand Hotel Buildings, Charing Cross, and transferred the stock to their premises in Regency Street, Westminster, to which address all communications should be sent.

It is stated that wood gas is made from inferior oak at the works of the Montezuma Copper Company, of Mexico, for use in gas-engines. The generator is a modification of the Loomis gas-producer, and was designed for coal fuel; so that the wood is "fed" in lengths of 18 inches. When wet wood is burned, the water gas is made without the injection of steam; the water in the wood supplying the necessary steam.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or Stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

Wanted, For Sale, and Tender Advertisements, Six Lines and under 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

One Year, 21s.; Half Year, 10s. 6d.; Quarter, 6s. 6d.

Payable in Advance. If credit is taken, the charge is 25s. a year.

All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C.

Telegrams: "GASKING, LONDON." Telephone: P.O. 1571a Central.

GAS PURIFICATION AND CHEMICAL COMPANY, LIMITED.

OXIDE OF IRON.

O'NEILL'S Oxide has a larger annual sale than all other Oxides combined. Purity and uniformity of quality guaranteed.

JOHN WM. O'NEILL, Managing Director,
160, 161, & 162, PALMERSTON HOUSE,
OLD BROAD STREET,
LONDON, E.C.

ANDREW STEPHENSON, AGENT. All communications RE OXIDE to the COMPANY as above.

WINKELMANN'S

"VOLCANIC" FIRE CEMENT.

Resists 4500° Fahr. Best for GAS-WORKS.

ANDREW STEPHENSON, 182, Palmerston House, Old Broad Street, London, E.C. "Volcanism, London."

BROTHERTON & CO., LIMITED.

Offices: Commercial Buildings, LEEDS. Correspondence invited.

PENNY-IN-THE-SLOT WORK.

H. GREENE & SONS, Ltd., are prepared to give QUOTATIONS to Gas Companies or Corporations for FITTING UP COMPLETE and CARRYING OUT the WORK in its entirety, either in Iron or Compo.

19, FARRINGDON ROAD, LONDON, E.C.
Telegrams: "LUMINOSITY."

HYDRATED OXIDE OF IRON.

PREPARED from Pure Iron.

Twice as Rich as Bog Ore.
Gives no Back Pressure.
The Cheapest in the Market.
Can be Lent on Hire.
Can be Exchanged for Spent Oxide.

READ HOLLIDAY AND SONS, LTD., HUDDERSFIELD.

AMMONIACAL LIQUOR wanted.

BROTHERTON AND CO., LTD., Ammonia Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SPECIAL PAINT FOR GAS-WORKS.

JOHN E. WILLIAMS AND CO.,
VICTORIA PAINT WORKS,
MANCHESTER.

Telegrams: "ENAMEL." National Telephone 1759.

JOHN RILEY & SONS, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol. References given to Gas Companies.

STREET AND SHOP LAMPS AND LANTERNS.

MARK DUFFIELD & SONS (Established 200 Years), makers of Street and Shop Lamps to own Pattern and Design. Any description of Lamp made. Inquiries invited.

London Manager: EDWARD PADFIELD, West India House, 96 & 98, LEADENHALL STREET, E.C.
Telegraphic Address: "EUPATHY, LONDON."

PATENTS AND TRADE MARKS

PUBLICATIONS. "MERCHANDISE MARKS ACT, and Decisions thereunder," 1s.; "TRADE SECRETS v. PATENTS," 6d.; "DOCTRINE of EQUIVALENTS, Mechanical and Chemical," 6d.; "SUBJECT-MATTER of PATENTS," 6d.

MEWBURN, ELLIS, & PRYOR, Chartered Patent Agents, 70 and 72, Chancery Lane, London, W.C. Telegrams: "Patent London." Telephone: No. 248 Holborn.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E.

First-Class Award, Melbourne Exhibition, 1889, for WET AND DRY GAS-METERS, STATION METERS, AND GOVERNORS, PRESSURE-GAUGES, STREET LAMPS AND PILLARS, &c.

Telegraphic Addresses:
"Braddock, Oldham." "Metrique, London."

DUTCH OXIDE OF IRON.

EERSTE Hollandsche Yzererts Maaty
(First Dutch Bog Ore Company, Ltd.),
ROTTERDAM.

General Manager (for England and Wales)—
CHARLES E. FRY, Leamington; and at Tower Chambers, Brown Street, MANCHESTER.

London Managers—
E. PADFIELD & CO., 96-98, Leadenhall Street, LONDON, E.C.

General Manager (for Scotland)—
J. B. MACDERMOTT, 11, Bothwell St., GLASGOW.

SULPHURIC ACID for Sale.

BROTHERTON AND CO., LTD., Chemical Manufacturers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

TO GAS AND WATER OFFICIALS.

HIGHEST Grade Cycles, "Premiers," "Court Royals," "Triumphs," "Humbers," "Swifts," "Centaurs," and all best and choicest Coventry Manufactures on SPECIAL TERMS to GAS and WATER OFFICIALS. Agents Wanted.

Apply to the MANAGER, Imperial Cycle Supply Company, COVENTRY.

PROVINCIAL Gas Companies may profitably consider the advantages offered by ACETYLENE for the PUBLIC and PRIVATE LIGHTING of OUTLYING PORTIONS OF THEIR DISTRICTS, which do not at present justify the expense of laying Coal-Gas Mains from the Central Works.

Correspondence on this subject is invited by the ACETYLENE ILLUMINATING COMPANY, LIMITED, 3, Victoria Street, LONDON, S.W.

TO GAS AND WATER OFFICIALS.

HIGH CLASS CYCLES at lowest Prices guaranteed and sent on APPROVAL for Cash or GRADUAL PAYMENTS. Catalogue and Testimonials from Gas Managers post free.

MELROSE CYCLE COMPANY, COVENTRY.

SULPHATE OF AMMONIA

SATURATORS and LEAD WORK for Sulphate of Ammonia Plants.

For REPAIRS or ALTERATIONS, ring up "0848 BOLTON," or Telegraph "SATURATORS, BOLTON."

Largest Practice and most Up-to-Date Works in Britain.

JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.

IT is worth your while to buy direct.

THE RELIANCE LUBRICATING OIL COMPANY 19 and 20, Water Lane, Great Tower Street, London, E.C., handle all kinds of Lubricating Oils, for Engines, Cylinders, Dynamos, Spindles, &c., Burning Oils, Solar Distillates, Carburetting Oils, and Spirits for Gas Making; Motor Oils, Fuel Oils, Animal, Fish, and Vegetable Oils, &c., for all purposes. Write for our "Trade Mark" Inkstand, sent free to customers. Non-customers, 2s. 6d. each. RELIANCE LUBRICATING OIL COMPANY, London, Glasgow, Newcastle-on-Tyne, &c. Established 1858. Telegraphic Address: "Subastral," London; A.B.C. Code used. Telephone No.: Avenue 5691.

COAL GAS TAR wanted.

State Quantity to offer for Prompt and Forward Delivery.

The SHARPNESS CHEMICAL COMPANY, Tar Distillers, Sharpness Docks, GLOS.

OXIDE OF IRON.

FIRE Cement, Paint, Mains, Tubes,
STREET LANTERNS, GLASS, TOOLS, &c.
BALE & CHURCH,
5, CROOKED LANE, CANNON STREET,
LONDON, E.C.

LIME
FOR GAS PURIFICATION.

THE DUNSTABLE LIME COMPANY,

Works: Sewell, Dunstable, Knebworth, Stamford, and Peterborough, Great Northern, Midland, and London and North-Western Railways.

Copy of Analysis of Lime from Knebworth Works—

Calcium Oxide (Quick Lime) . .	98·9
Magnesia and Alumina	0·5
Silica	0·6
	100·0

Head Office: PETERBOROUGH.

GAS TAR wanted.

BROTHERTON AND CO., LTD., Tar Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

RE ADVERTISEMENT FOR FITTERS.

THE Manager of the Ilford Gas Company wishes to THANK those who applied, and also to inform them that the vacancies HAVE NOW BEEN FILLED.

STOKER required, immediately, for a Country Gas-Works. Wages, 24s. 6d. per week.

Apply, by letter, giving References, to the MANAGER, Gas-Works, Sharpness Docks, GLOS.

STOKER wanted. A good, steady Man, used to Shovel Charging and Exhauster. 5s. per Eight-hour shift. Permanency for suitable Man.

Apply, with *copies* of Testimonials, to GAS MANAGER, BRITON FERRY.

WANTED, a good Stoker, used to Shovel Charging, and Engine and Exhauster. None but steady and reliable Men need apply.

Apply, stating Age, and Wages required, to G. MOAT, Gas-Works, Purston, PONTEFRACT.

WANTED, a Gas-Fitter. Must be steady and reliable. One used to Iron and Compo. and fixing Gas Cookers and Fires.

Apply, by letter, stating Age, Wages required, and Experience, with *copies* of Testimonials, to No. 3925, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

CITY OF BIRMINGHAM.
(GAS DEPARTMENT.)

GAS-FITTERS WANTED.

APPLICANTS, under 40 years of age, must be fully qualified, used to fixing Wet Meters, and accustomed to all classes of Compo. and Iron Pipe Work, Stoves and Chandelier Fixing. Sample Meter Joints must be made by applicants prior to engagement. Permanent employment for suitable Men. Wages 8d. per hour, rising to 8½d. at end of Three Months if work and conduct are satisfactory.

Apply, with *copies* of Two recent Testimonials, to FITTINGS SUPERINTENDENT, Gas Offices, BIRMINGHAM.